

Electrical Contracting

November 1934

With Which Is Consolidated
The Electragist and Electrical Record



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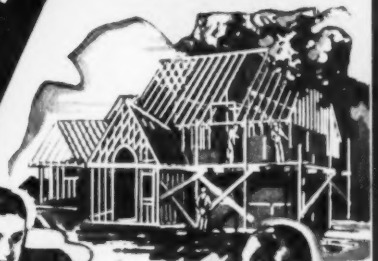
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VOLUME 34
NUMBER 1

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

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CONTENTS FOR NOVEMBER, 1934

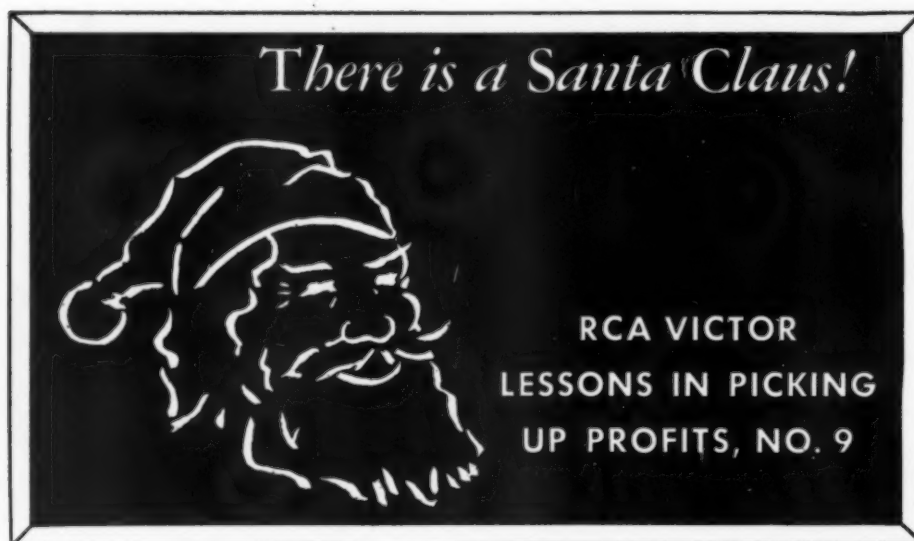
John Wise	5
The Selection of Men for Modernization Work by F. J. Seiler.....	6
Wiring Conditions Found in Factories—No. 2— A Battery Factory	8
Modern Electrical Work Helps Sell Repossessed Homes	9
Mass Production Methods for 2-Hour Jobs....	11
Shielded Bus Bar Rack.....	13
Inspection Department Operations.....	14
Remodeling Opportunities in Hazardous Loca- tions	16
Selling Safety and Adequacy by Systematic Reinspection	17
Editorials	18
Code Chats	20
Code Authority News	26
Contracting News	32
Practical Methods	44
Manufacturers News	48
Index to Advertisers.....	54

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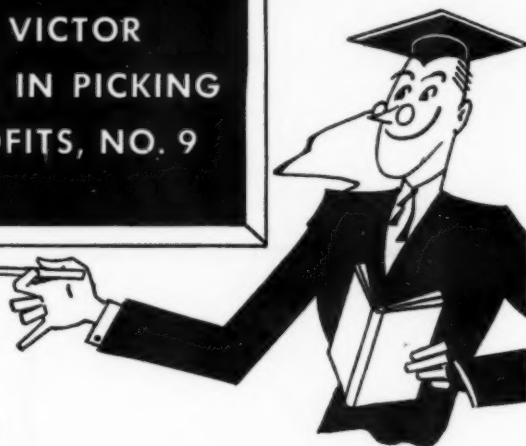
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Price Maintenance

A WORD of caution is necessary in connection with the results expected from the National Electrical Contractors Association's program to secure a differential for the contractor in the manufacturers' price sheets. Even if all of the manufacturers were to adopt such a policy the contractors would still have the problem of the direct selling wholesaler.

THERE are a number of wholesalers that do the major portion, if not all of their business with industrials, buildings and institutions. Are these concerns going to recognize any contractor differentials? And if they continue to sell these ultimate users at contractors' prices will not the other wholesalers be forced to do likewise?

The contractor has no objection to a wholesaler selling the ultimate user, provided the price is greater than the contractor pays for a similar quantity. It so happens, however, that industrials now may buy at contractor's price or lower in almost any quantity.

This situation is recognized by the wholesalers and they would like very much to see it changed. No one cares to start it because some other wholesaler would get the business.

The manufacturer by virtue of his code must abide by his own price schedules, but there is nothing in the wholesalers' code that requires a wholesaler to abide by a manufacturer's price schedule. In other words, it is possible for wholesalers to offer prices below what their own suppliers can

offer the material, and that situation has occurred.

In fact, without some sort of an effective arrangement with the wholesalers it would be quite possible for the present situation to continue even with apparently fair manufacturers' schedules because the manufacturers could then work out their direct selling plans through their wholesalers.

THE answer, of course, to this situation is a change in our national law or N.R.A. policy that will permit a manufacturer to demand price maintenance on the part of his distributors. Then when a distributor sells below the proper price, the manufacturer has the responsibility of taking action. Until we get such a change there is little that can be done nationally.

Of course, locally there is much that can be done through organization. Wholesalers, as a whole, would welcome a strong contractor policy. They are as eager as anyone for price maintenance and fair competition. They want to be sure, of course, that everyone plays ball.

The question of whether the contractor will maintain the price or not is of little importance. Some, of course, will give away some of their compensation. Most contractors, however, will retain all that they get because they know that even then they will not be making a great deal.

It is only when the wholesaler and manufacturer enter into competition with their own customers that the business suffers because such practices discourage the contractor from trying to sell.

BIG MONEY



GET YOUR SHARE

... The government expects \$1,500,000,000 will be loaned by January 1, 1936, under the National Housing Act. This money will be spent for home remodeling and repairs.

The electrical contractor can have a good share—providing he goes after his opportunity aggressively.

The money is there. Government support is making it available. The market, certainly, is

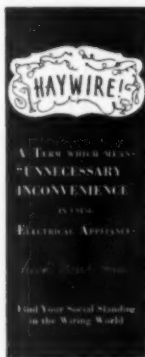
there. But it is up to the individual electrical contractor to *sell* specific remodeling jobs. Sell *convenience*. Sell *safety*. Show the home-owner what a new wiring installation will mean *in terms of home comfort*.

Graybar has prepared an unusually interesting booklet to help you with your selling job. Its title is "Haywire." It explains to prospective customers, in everyday language, the "reason why" of better home wiring. Ask us about this booklet. Write us... or mail the coupon below for full information. Do it today!

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VOLUME 34
NUMBER 1

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

NOVEMBER
1934



As the story ended, King David flew into a rage, demanding the name and whereabouts of the offender, that he might have him put to death. But when Nathan told him *he* was the guilty one, David was overcome with shame and remorse. The incident changed his life completely; after making what amends he could he never forgot the lesson and lived righteously.

The modern version of this parable is shown by such incidents as one I ran into recently. A small contractor bid \$70 on a new service and other wiring for a neighbor who was doing remodeling which totaled over \$800. The customer kicked and did some shopping. Right away a big contractor, who had plenty of other work, took the job at a much lower price, then proceeded to gum it up, putting in a smaller service and ducking inspection. The result was plenty of trouble and the job had to be corrected—a loss to all concerned.

Now, in the electrical contracting business, I have always been for the survival of the fittest. To me the saying: "Them as has, gits," means that the constant hustler is bound to build up volume and profit. There is no law against any contractor going after business anywhere. But I certainly am against the big fellows going into the little man's neighborhood and taking jobs from under his nose, particularly on an unfair basis.

Kipling said a mouthful when he put this down:

*When you plunder his kill from a weaker,
Devour not all in thy pride;
Pack-right is the right of the meanest,
So leave him the head and the hide.*

The Bible tells us that, when David was King of Israel, he was a successful monarch, with everything to his liking, including success in battle, a large and happy household and a prosperous Kingdom. Yet, in spite of all his blessings, he fell from grace and committed a grievous offense against the teachings of the Lord he so devoutly worshipped. Coveting the wife of Uriah the Hittite, one of his soldiers, David made sure of the man's death by having him betrayed into the enemy's hands, then seized Uriah's widow for himself.

Nathan, the Lord's messenger, came and told David a parable. It seems there was a rich man who had much land and many flocks and herds. Nearby there lived a very poor man, whose only possession was one ewe lamb, the pet of his family. But when the greedy rich man had a guest from afar, he spared his own flocks and killed the poor man's ewe lamb for the feast.

Personal Assets for Wiremen

1. Neat appearance.
2. Good habits and conduct.
3. Congenial disposition.
4. Exactness and punctuality.
5. Tact in handling "cranks".
6. Patience with interferences from children or employees.
7. Avoidance of gossip or argument over politics, religion, labor.
8. Indifference to intimate or confidential home or business surroundings.
9. Respect for and careful handling of customer's premises, furnishings or equipment.
10. Judgment and fairness in complaints about service, damages or changes in work.



Trade Assets for Wiremen

1. Mechanical skill.
2. Sales ability.
3. Cooperation with employer.
4. Correct and usable tools.
5. Avoidance of unnecessary "muss".
6. Aptness in sizing up jobs, speedy makeready and pickup.
7. Knowledge of practical methods, kinks, shortcuts, measuring and testing.
8. Familiarity with approved wiring materials and fittings.
9. Knowledge of structures: Framing, furring, paneling, insulation, tile, plaster, wallpaper.
10. Legible completion of time and material slips, work orders, work description.

The Selection of Men for Modernization Work

By F. J. Seiler
Assistant Editor,
ELECTRICAL CONTRACTING

SELECTING the men who are best suited for modernization and remodeling work can only be done after analyzing the nature of the work to be performed. Work-sharing programs must be kept within the bounds of efficient production, in order to meet narrow competitive margins. Most loyal workmen of proven skill and efficiency in new construction can adapt themselves equally well to old work, provided the contractor will study their past

performance and personality so as to single out the types that are best fitted to the specific classes of old work.

A "rough-and-ready" wireman, accustomed, clothed and equipped for big job crew methods would, no doubt, get along very well on an apartment house or commercial service installation. However, to send him out alone to a residence outlet job or to an exclusive gown shop might not work out so well at the

outset. There are, in other words, several divisions under which such work can be classified for the purpose of choosing men who are most likely to adapt themselves to the operations and responsibilities involved. The choice of men and their training and coaching remains the obligation of the contractor, if a profitable venture into the modernization field is contemplated. This choice or selection hinges upon a review of the problems which face the workman

in the several types of work encountered.

Experienced modernization and remodeling men are most likely already employed in shops where such work has been a specialty in the past. It remains, therefore, for the contractor to select men from his crew who appear most apt to suit the conditions of such work. Time and experience will develop from among those selections the men whose personalities and mechanical skill will clearly show their adaptation to certain kinds of work.

It has often been said that a capable wireman may be judged by his on-the-job appearance. Clean shaven, eye-twinkling chaps usually have a smile for every occasion, and a clear head for knotty problems which pop up so unexpectedly. A trend among radio, refrigerator and other organizations for supplying neatly uniformed service men leaves no excuse for untidy, unshaven wiremen to work in homes or offices without casting some reflection on the employer. Contractors should check up the men they send out on reasonably clean jobs.

It pays to get together about some of the intimate troubles encountered. Weekly or monthly group meetings will prove enlightening to all concerned in bringing forth discussions about improved methods and ways to settle customer problems.

There can be very little profit in this class of work when high workmen turnovers prevail. Careful selections must be followed out with painstaking cooperation on the part of the contractor to see that the men most suited for such work are kept employed.

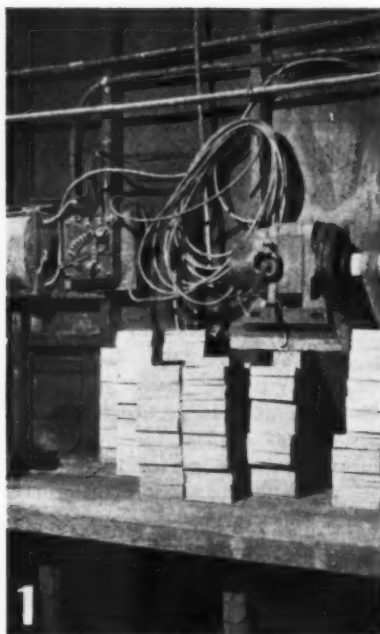
Duties of Workmen

<p>Occupied Residences and Apartments:</p> <ol style="list-style-type: none"> 1—Work must be performed in the presence of women and children, requiring neat appearance, patience and proper conduct. Diplomacy is necessary in selling more work, or in doing the work ordered should unforeseen difficulties arise. 2—Extreme care in locating accessible fishing spaces, places to bore, removal of mouldings and baseboards, taking up flooring, cutting into plaster, handling old wallpaper. 3—Neatness in minimizing mess, also care in working around furniture and breakable furnishings and in their moving and replacement upon completion. 4—Tolerance in taking orders and accepting criticism from housewives, without engaging in disputes. 5—Avoidance of lengthy discussions as one way to eliminate many complaints of excessive labor charges. 	<p>Stores and Offices:</p> <ol style="list-style-type: none"> 1—The knack of working in the midst of crowded or busy areas with a minimum inconvenience to customers or employees. 2—Care in handling tools and materials so as to avoid injury to persons, damage to furniture or the breakage of stock or merchandise. 3—Diplomacy in arranging for access to restricted areas, cutting off current, or moving of obstructions. 4—Ability to converse with business men in response to questions about work, additions, etc. 5—Restraint in accepting rebukes or criticism from executives accustomed to issuing orders to their own employees. 6—Controlled curiosity while working around sales areas, near conferences, among important records, or where merchandise is on display. 7—Care in personal conduct, neat appearance and the curbing of rough language. 	<p>Industrial Work:</p> <ol style="list-style-type: none"> 1—Ability to adjust oneself at the beginning to plant rules or restrictions. 2—Willingness to disregard on the job working conditions affecting plant employees and to promise to foment no labor disturbance in any plant. 3—Diplomacy to secure the cooperation of plant foremen in the work to be performed and in arranging access to areas where work is to be done. 4—Ability to observe operating conditions and facilities for leads on further work or improvements. 5—Willingness to follow orders from plant executives, and the ability to discuss problems with them intelligently. 6—Care and skill in working around important machinery and equipment and in making alterations to wiring without interrupting operations. 7—A special knack for motor and control equipment, and general industrial electrical equipment as in contrast with residential or commercial installations.
<p>In addition to the foregoing, the individual workman should acquire a knowledge of certain general conditions.</p> <ol style="list-style-type: none"> 1—Local wiring Code regulations and utility rulings affecting unforeseen changes or additions to layout. 	<ol style="list-style-type: none"> 2—Types of earlier materials, devices and replacements, with a general idea of values as compared with modern devices. 3—Modern materials and methods most suitable to modernization work. 4—Shop methods of billing, credit 	<p>arrangement, material purchase and delivery schedules.</p> <ol style="list-style-type: none"> 5—Knack for judging old materials, whether usable or more economical to replace with new. 6—Ability to work more or less alone, without a job or crew foreman to supervise his work.

WIRING CONDITIONS FOUND IN FACTORIES

No. 2—A Battery Factory

Many of our small industries have experienced a "patched-on" growth, therefore real selling efforts must be put forth with owner economies properly stressed.



Non-Productive Lighting

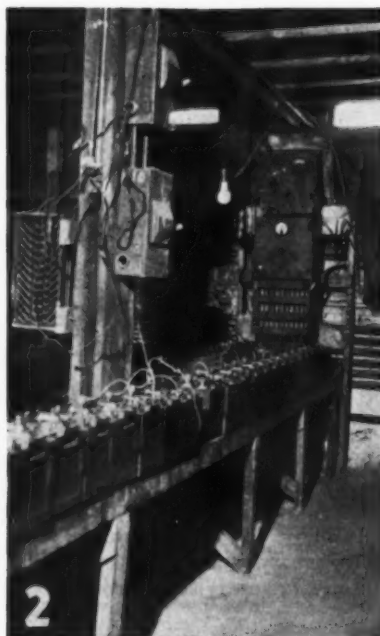
Breakage, shop waste and errors from eye strain, slowed-up production, and time lost in adjusting and "nursing" cobweb lighting systems more than equal the cost of correct equipment.

Efficient Operations

Amateurish and neglected wiring system breakdowns interrupt production. Current leaks mean costly energy losses. Bad contacts increase fuse blowout shut-downs and replacement costs.

Safety vs. Liability

Grounding and live contact human hazards are generally prevalent and represent a menace to employee safety.



1—3 H. P. motor operating blower without ground connections. Note open rheostat and motor wiring hung on nails. Armored cable branch tap draped along wall and not fused where connected to power mains.

2—One of three charging aisles, showing open wire for resistors tapped to original conduit wiring system.

3—How plant employees install armored cable. Small externally operated switch on column controls open pony type switch below, the latter being the compressor control switch. Wires to compressor, also to work-bench grinder motors and drops are run open, tacked in place.

4—A "flexible" drop cord lighting system for acid process room. All wiring is open draped on overhead water pipe and on wooden braces.



Modern Electrical Work Helps Sell Repossessed Homes

THE methods of modernizing repossessed homes for resale as recently commenced by a large insurance company in several mid-western cities offers a desirable electrical contracting market. In four of their reconditioned Kansas City homes the electrical work averaged \$133.00 each, or about 7½ percent of the amount spent for modernization. If the separate installation for the power company of range and water heater wiring, and also the hanging of the lighting fixtures are included, the average job then totals about \$264.00 or 14 percent of the average sum spent per home.

The main objectives in home modernization as outlined by a home reconditioning staff expert of this insurance company were: (1) Clean up and repair exterior of structure and grounds, (2) remove all possible "gin-

ger bread" evidences of early design, (3) recondition interior to remove all possible evidence of prior occupancy, (4) provide modern equipment to meet present standards of convenience, safety and permanency, and (5) concentrate sales effort upon the features provided so as to lessen the "old house" complex.

The installation of safe, convenient and adequate wiring facilities as required in present day use is considered an important feature to enhance the salability of repossessed homes. Objective features are tackled first, with the order of procedure as follows:

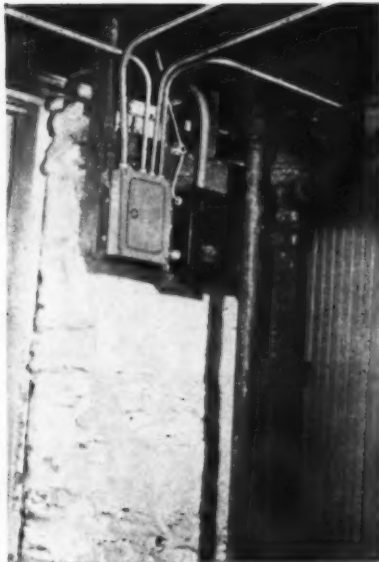
1. Remove all makeshift and unsafe wiring.
2. Replace obsolete lighting fixtures with modern types.
3. Rearrange kitchens for most efficient layout with adequate wiring for all electrical needs.
4. Replace old style wiring devices and plates with types to harmonize with decorative effects.
5. Enclose all open basement wiring with conduit, unless in exceptionally good condition.
6. Install switches, wherever omitted, for all ceiling fixtures and for bathroom fixtures.



House "A"



The modernized electric kitchen on the right replaced the kitchen on the left



A new service with six circuits replacing the original two—separate circuits for refrigerator, basement, exhaust fan in attic and kitchen plugs.

7. Arrange outlets and switch control for stairways to assure safety and convenience.
8. Provide sufficient convenience outlets so that there is no need for home-made additional wiring.
9. Provide closet lights to eliminate inconvenience and possible fire hazard.
10. Recircuit wiring to provide adequate capacity for all outlets.

Job Analysis

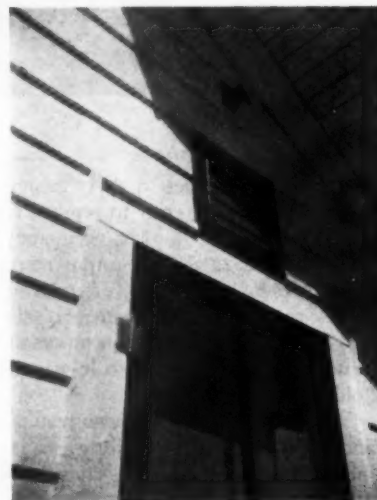
To illustrate the scope of this modernization activity, and the prominence of the electrical work, a summary of the first four Kansas City residences which were modernized is given herewith:

Summary of Modernization Expenditures

	Sale Price	Expended	Wiring	Fixtures
House "A".....	\$ 4,900.00	\$1,400.00	\$119.00	\$60.00
"B".....	5,700.00	1,500.00	88.00	80.00
"C".....	7,500.00	1,560.00	161.00	91.00
"D".....	11,500.00	2,490.00	165.00	114.00
Average Values	\$ 7,400.00	\$1,737.50	\$133.25	\$86.25

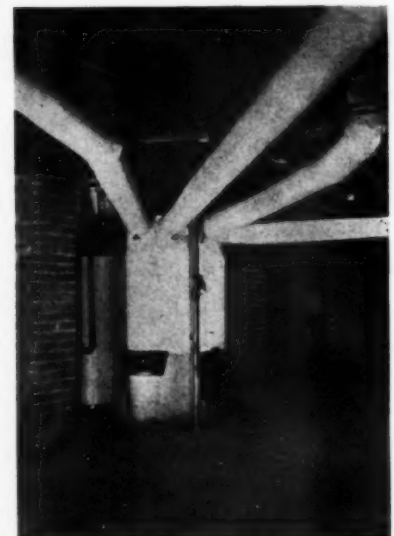
It should be noted that none of the above wiring prices included range and water heater wiring, or new combination services, as this work is installed separately under utility range campaign contracts.

To make the average 15 to 20 year



Part of the modernization is the installation of an exhaust fan. Here the louvre is seen above the kitchen door and above that a new outdoor light.

modernization practice prove beyond question that a public acceptance or demand for safe and adequate wiring has been recognized by those responsible for the sale of homes. Red Seal activities have registered a definite appeal with a discriminating public to such an extent that smaller real-estate organizations are also becoming forced to follow the examples of these larger operators. Safe and neat basement wiring, adequate convenience outlets, switches for all ceiling outlets, new and modern lighting fixtures and wiring devices throughout have become prominent necessities.



A modernized basement with metallic tubing to all riser points with junction boxes for armored cable taps to new upstairs outlets and for picking up the concealed knob-and-tube wiring.

Electrical Contracting, November, 1934

Schedule of Added Outlets in House "A"

	Cl	Brkt	Conv	SP	3-way	Miscellaneous
Kitchen	2	..	4	2	..	Kitchen, dishwasher sep. circ.
Bathroom	1	2	1	2	..	Kitchen, Refrig. sep. circ.
Living Room ... ..	..	3	3	..	..	Kitchen, Concealed light over sink.
Dining Room... ..	..	..	2	..	..	Kitchen, Exhaust fan on sw.
Hall	1	..	..	..	2	Bath—Sun lamp outlet on sw.
Porch .....	..	..	1	..	..	All old switches replaced.
N.W. Bedroom... ..	..	..	2	1	..	Basement runs in electrical metallic tubing.
S.W. Bedroom... ..	..	..	2	1	..	
East Bedroom... ..	..	..	3	..	..
Closets	2	..	..	..	..
Total	6	5	18	6	2	

Mass Production Methods for 2-Hour Jobs

A GROUP of Detroit electrical contractors have been busy for some time in changing a part of that city's 450,000 residence meters to outdoor installations. Some contractors have already installed upwards of 2500 such jobs, all of which have been done for the Detroit Edison Company for a flat price of \$5.50 per meter.

This work was obtained from the utility as the result of an agreement between the employers and electrical workers establishing a definite labor cost of 2 man-hours at \$1.25 per hour for each meter changed. This change-over is providing steady employment for 60 to 75 wiremen at a time when very little new work is available. Furthermore, by reason of this activity, many of these contractors are learning how to handle small work of this nature more efficiently. Efficient methods were developed for providing ample tools and materials, and for their transportation.

The Detroit Edison Company adopted a plan to change all residence meters in a certain area in one continuous operation rather than undergo the expense and confusion of scattered city-wide operations. Work orders are therefore issued to individual contractors by the utility in lots of 200 to 400 meter locations, carefully routed so as to completely modernize a certain street or city square.

The jobs are prearranged for house-to-house conversion by the utility's field supervisor who spots the exact meter locations. To justify a supervisor, and a meter installer full time the utility specified that a crew of six wiremen be employed in each district.

Crew Methods

A seven hour day plan is followed from 8:30 A. M. to 4:00 P. M., which gives the housewife a chance to clear away her breakfast chores and avoids interference too near the dinner hour. On the established production basis of 2 man-hours per meter, with six men working seven



(Left)—A typical Detroit single-meter installation on a two-wire service. Lower conduit is part of original service, while new conduit, service cap, and service wires are installed down to meter housing.

(Right)—Two separate conduit runs enclose the five sets of metered submains which are carried to the existing meter switches within the basement.

hours, or a total of 42 man-hours per day, twenty-one meter changes are made each day per crew. The 6-man crews work in pairs, as it was found that the taking down and reinstalling of service conduit and the removal of service wires could be done more quickly by two men than by working alone.

One member of each crew is also the job foreman to work out special

conditions with the utility's field supervisor. Problems arising between customers and wiremen over cutting off radio programs, washing machines, vacuum cleaners or irons, access to premises, etc., are ordinarily adjusted by the utility supervisor, but these problems must occasionally be settled with a foreman's diplomacy. Also special care is necessary to avoid the defacement of structures in removing old materials and in supporting new runs.

Material Problem

Under the guaranteed unit production plan which was worked out with labor, each contractor is obligated to supply his crew with ample quantities of all necessary materials and tools, so as to avoid standby or non-productive time. Separate job material lists are not kept, but instead a material summary is made in the office after the completion of an entire district. This shows the total amount of materials charged out, less the inventory of unused materials, upon the completion of the district. From this summary, which may involve from 200 to 400 meter changes, it is possible to compute average costs.

Since these jobs averaged only one hour's work per meter for two wiremen, the base of supplies had to be mobile, so as to keep it as near as possible to houses where meters were being changed.

Among the various portable supply outfits developed by the Detroit contractors for this work, is a trailer-mounted stock and tool storage house designed by the McCleary-Harmon Electric Company at a cost of less than \$100.00. While some contractors have equipped a special truck for their crew's full time use, this trailer design provided ample capacity without such an investment, besides eliminating or reducing such overhead expenses as automobile insurance, motor upkeep, taxes and licenses.

This trailer outfit is mounted and balanced midway upon the axle and wheel assembly out of a large type



Crew Supply Trailer

(Top) — Conduit supply compartment, with pipe vise on ledge above.

(Middle) — This side contains 30 separate bins, each kept filled with the necessary small materials items.

(Bottom) — Wire coils are kept in end compartment from which the desired lengths are reeled off and cut. No wire coils are carried about the job. Bare wire spools are mounted upon a spindle, which is secured to trailer roof, between two ladder racks. Note towing attachment and "retractable landing gear" made of 1½ in. pipe. Heavy coil springs pull this floor brace back under trailer when two notched angle irons are disengaged.

used automobile. It is equipped for attachment to the car of a wireman, who is compensated for towing it about the district and to and from the nearest overnight storage place.

A three-day supply of materials for six men can be accommodated in this trailer before restocking, thus keeping down delivery expense from the shop to an outlying district. It has a storage compartment which will accommodate about 1500 ft. of assorted sizes of conduit, while other compartments contain wire, miscellaneous small materials and tool boxes. A ladder rack is provided upon the trailer roof.

The conduit compartment of this trailer is 10 ft. 2 in. long, 4 ft. wide and 18 in. high, above which the balance of the body is set back 25 in. to provide a vise mounting ledge. A double-deck compartment at the front end contains built-in payout reels for coils of insulated wire, while a spindle upon the roof holds spools of bare copper wire. A lengthwise compartment on one side houses the wiremen's tool kits and pipe tools, while the opposite side consists of three horizontal rows of bins, which contain a complete assortment of conduit fittings, nipples, couplings, lock-nuts, bushings, strapping materials, screws, anchors, etc. Each compartment has a hinged door and padlock hasp, while the ladders may also be chained and padlocked.

Scope of Work

The electrical contractor furnishes all necessary materials except the outdoor meter housings. Existing materials are re-used if in good condition, except that new service wires, not smaller than No. 8, are installed up to the new outdoor meter housing. Old wires may be re-used between the new meter and former meter location. The contractor is required to replace defective service switches, corroded conduits and deteriorated service wire when so ordered by the utility field supervisor.

On simple installations having only one meter, the meter housing is cut into the existing service conduit if ¾ in. was originally installed. However, in many cases the new location of meter housings requires the re-routing of conduit and an increased amount of material. A summary of 1600 meter installations, completed by one Detroit firm shows the aver-

age quantities for three principal items of material furnished:

18,000 ft. No. 8 R. C. and	
bare wire combined.....	11.2 ft. per meter
45,400 ft. No. 10 R. C.	
wire	28.4 ft. per meter
9,580 ft. ¾ steel tubing..	6 ft. per meter

On installations involving two or more, some times six meters, the job becomes more complex since the main service run terminates at its interconnection to the various meter housings. Load side connections are then needed from each meter to its respective existing indoor meter service device, which introduces an assortment of nipples, angle fittings, and usually requires larger conduits than the existing service conduit. It was soon discovered that certain jobs could be done more quickly with entirely new runs, while the old material could be re-used elsewhere.

The varying circumstances of such work necessitates keeping at hand a complete supply of white, black and bare neutral service wire in several sizes, conduit, nipples, service and angle fittings, connecting fittings, strapping materials, screws and anchors, and several types of old style entrance switch replacement units.

Wiring Methods and Operations

The general methods and sequence of changeover operations follow:

1. Cut-off service drop at entrance cap.
2. Disconnect indoor meter loop.
3. Pull out old service conductors
4. Service conduit work:

A—(1) Take down complete service conduit assembly, or

- (2) If not completely removable because of being concreted in, or because of complicated rusted interior fittings, then saw off conduit at lower hub level of meter housing.

B—(1) Thread house side of service conduit (at trailer pipe vise), re-install, together with meter housing threaded on, or

- (2) Thread in place service conduit, while sprung out from wall, with ratchet type die—install meter housing, or
- (3) Replace corroded or damaged conduit, or

Electrical Contracting, November, 1934

- (4) Install two or more meter housings (on multi-meter jobs) — interconnect with nipples and angle fittings, install conduit to present meter switches of sufficient size to accommodate the required sets of metered sub-main connections.

C—(1) Thread (at trailer pipe vise) upper end of original service conduit, and attach to top meter housing hub.

- (2) Install new $\frac{3}{4}$ in. service conduit and entrance cap to replace $\frac{1}{2}$ in., or to replace knob-and-tube service.

5. Strap and secure conduit and meter housing:

A—Pipe straps and wood screws (frame construction).

B—One hole clamps and expansion shields (masonry construction).

C—Meter housings are separately fastened without depending on conduit for support.

6. Install new service wires to meter housing:

1-R.C. and 1-bare for 2-wire services.

2-R.C. and 1-bare to 3-wire services.

No. 8 smallest size permitted.

Cut wires to desired length at trailer payout reels.

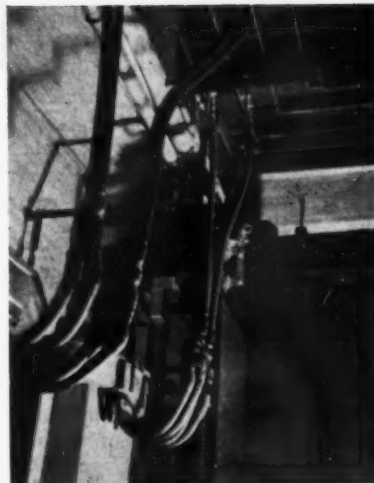
7. A—Install old (or new) wires from meter housing and connect to service switch.

B—Install old (some new) wires from meter housings and connect to the several meter switches.

8. Repair service switch or old meter switch defects.

9. Job now ready for meter setting and service reconnections.

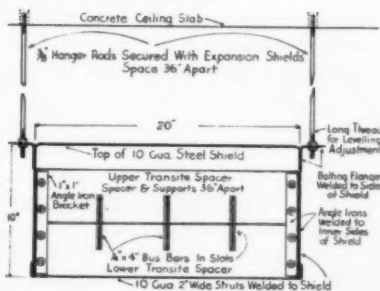
10. Load usable salvage material in trailer.



3—View of transformer room ceiling, showing right angle turns in both power and lighting bus racks leading toward main switchboard

Shielded Bus Bar Rack

AN insulated mounting rack for bus bar feeders which also is shielded above and at its sides from moisture drippage and dirt gatherings was installed by Porter, Gloré & Glass, Inc., Indianapolis, Ind., in a large job at Indianapolis. This method was used in transformer room for the secondary feeders between the transformers and main switchboard. Three $\frac{1}{8}$ in. by 4 in.

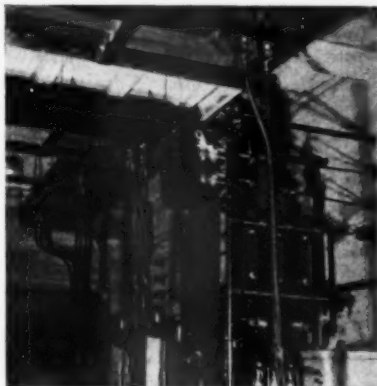


4—Details of rack and shield

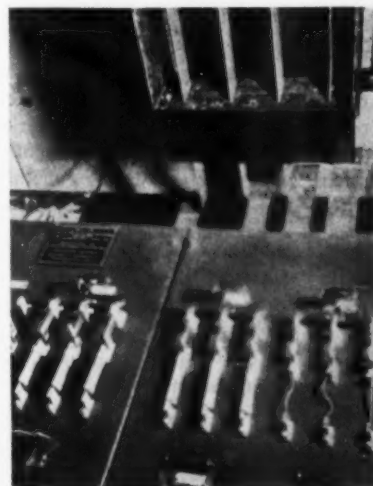
busses were used for 440-volt secondary feeders from three 100 k.v.a. power transformers, and four $\frac{1}{4}$ in. by 4 in. busses were used for 115-volt, 3-phase, 4-wire secondary feeders from three 100 k.v.a. lighting transformers.

The power bus shields were made of overlapped sheets of 10 ga. steel formed 20 in. wide and flanged down 10 in. at sides, while the lighting bus shield was made 24 in. wide. Two piece assemblies of $\frac{1}{2}$ in. transite, slotted to fit over and to support the vertical edgewise mounted bus bars were spaced edgewise within the shield on 36 in. centers, at right angles to the busses. One inch by one

inch vertical angle irons were spot welded to inside face of 10 in. side shields to provide bolting flanges for the transite bus supports. Each angle was predrilled for four transite mounting bolts, two for the upper half and two for the lower half. The steel shield was installed in place before the installation of bus bars, being supported from ceiling with $\frac{1}{8}$ in. hanger rods bolted to flanges which were spotwelded to upper sides of shield on 36 in. centers. Two in. wide 10 ga. steel stiffening struts were spotwelded across the opposite bottom edges of 10 in. shield flange at bus supporting locations.



1—View of right-angle turn in four $\frac{1}{8}$ in. by 4 in. lighting bus at transformers



2— $\frac{1}{8}$ in. by 4 in. bus showing connections to extended bus bars at rear of main switchboard

Inspection Department Operations

Brief analysis of the results of a survey among electrical inspection departments in a number of cities aggregating nearly thirteen million population, made by the Electrical Industry Committee of Portland, Ore.

THE city of Portland, Ore., in common with most municipalities throughout the country, has seen its electrical inspection department seriously curtailed in personnel and in its activities by a program of economy on the part of the city administration.

It was natural that those who were connected with the electrical industry, and others, did not wish to see their really fine and efficiently operating inspection department cut down to a degree that would throw its status back to that of a great many years ago. Some of them sought to bring logical argument to bear, looking to the early restoration of the department to its former basis.

"City fathers," however, are accustomed to hearing the protests of many groups. Their attitude of recent times has been more and more of the show-us order. "What are the facts on which you base your statements?" is a question often found hard to answer. That competent electrical inspection of work newly installed, and the re-inspection work of the order they had, until recently, in Portland, make for the safety of life and property, are to the interest of the property owner while at the same time producing business and making work for many men locally, are arguments which, when presented in general terms, seem to have little weight in times of stress.

It was at this stage that a group of men, known as the Electrical Industry Committee, decided to secure facts and figures bearing out their arguments for an electrical inspection department restored to its former strength and efficiency. They decided to make a survey of the electrical inspection departments of a great many cities throughout the country, designed to show how important electrical inspection work really is. The information so developed was then to

be put into tangible form for presentation.

This committee, sponsored primarily by the electrical contractors in Portland, consists of: H. C. Ploense, chairman, Morrison Electric Co., electrical contractor; Walter Kenney, Ramsey Sign Co., Inc.; Sidney G. Ward, Graybar Electric Co.; P. E. Linzelle, Otis Elevator Co.; Joe Lake, Local 48 I.B.E.W.; Fred D. Weber, Oregon Insurance Rating Bureau; A. T. Erickson, Powers Furniture Co.; and Y. C. Bressie, Bressie Electric Co., electrical contractor.

The survey was completed late in August. The chiefs of the electrical inspection departments in some 35 leading cities in the United States had been sent an elaborate questionnaire, and a number had been sent to large cities in Canada as a check. Of the returns received, those from cities in the United States which were complete enough for analysis, numbered 17, and were from cities ranging

in population from 200,000 up to 3,600,000. The total population represented by the 17 was 12,962,775.

The questionnaire itself was a most elaborate one. There were in all 48 questions asked, many of them calling for detailed information, and, in some cases quite extensive tabulations of figures.

It is impossible here to give a complete tabulation of the returns. In fact, much of the information would not lend itself to tabular presentation. An attempt will be made, however, to give the gist of the reports, in connection with such matters as are of interest to electrical contractors, and will be divided into two phases. The first is information of a general nature in relation to inspection department activities, which might be termed current. The second will touch upon information contained in reports which extends back over a period of years, to before depression times, which will indicate certain trends.

ELECTRICAL INSPECTION DEPARTMENT ACTIVITIES

Great Areas Covered: In the 17 cities, with an aggregate population of almost 13,000,000, the combined corporate area is 1,548 sq. mi., an average of 91 sq. mi. per city. Even to inspect new work, only, in such a territory, requires a small army of men.

Identity of the Departments: In only four cases out of the 17 was the electrical inspection department set up as a separate one, reporting to the city executive authority. In most cases it comes under the department of buildings and sometimes under the bureau of public safety, bureau of streets and electricity, engineering department, etc.

What Wiring Code Is Followed: In approximately 70 per cent of the cases, the National Electrical Code with a supplement is followed. One

city used the N.E.C. in its entirety, two used a revision without supplement, one used the 1930 N.E.C. with amendments, one failed to answer this question, while one large city was stated to have none.

Filing Plans and Specifications: The question was asked if, where no plan examiner was employed, the department required filing of plans and specifications before issuance of permit. There was only one outright "yes" to this question. Four required none to be filed, while the others did, with reservations such as on "large jobs"; commercial buildings, only; "on request"; electrical jobs over \$1,000; except flats and dwellings under 23 K.W., etc.

Elevator Codes: To make the question specific, it was asked if the city had an elevator code such as the

Electrical Contracting, November, 1934

A.S.S. for elevators, dumb waiters and escalators. In 55 per cent of the cases, they had, while 25 per cent had none at all. The rest were working under state codes. In eight cases out of the 17, the inspection of the electrical end of the installation was under the jurisdiction of the electrical inspection department, in others it came under the building inspector, elevator inspector, etc.

There was great diversity as to fees charged and the methods of basing them. These ranged from flat rates, to charges on the basis of H.P. rating, cost of the elevator installation, and on to more elaborate systems involving the class of elevator, number of circuits, etc. While many did not appear to be able to answer the added question, about 30 per cent did indicate that these fees did at least fully cover the cost of new elevator inspections. It was somewhat surprising, however, that out of 14 answering the question as to regular elevator re-inspection, to find that six had none. Where regular re-inspection was carried on, a flat fee per car per year was charged.

Electric Signs: Bearing on the construction, erection and inspection of electric signs, it was indicated that about 40 per cent of the electrical

inspection departments had full supervision over all phases of the work. The rest had supervision over the electrical part, only. Again, there was uncertainty as to the coverage of the cost of this work by the fees, as only one or two answered the question. In fact, there seems to be uncertainty as to whether or not the revenue of the electrical inspection departments covers costs, in any of the various classes of work. Sometimes the money is turned over to the general fund of the city, and the expense of the departments budgeted out of the fund. Or the inspection department is hung onto some other department in such a way as to preclude definite knowledge on that point.

In the preponderance of cases, no provision was made for regular sign re-inspection.

Income was enhanced in three cases through the city charging rental fees for signs projecting over thoroughfares, in which case they either defrayed the inspection costs or exceeded them.

Radio Interference: Of all these large cities, only one had a radio interference ordinance, and that was restricted to certain medical appliances operating between the hours of 7 p. m. and midnight.

Sale Control: A trend toward the supervision of the sale of electrical appliances and materials, by ordinance, was manifested, five out of the 17 having such ordinances.

Who Gets the Credit? "Does the electrical inspection department get full credit for all revenue and licenses?" Six said "Yes", nine said "No", and two passed up the ball.

Civil Service: It was found that of 17 chief electrical inspectors, 11 were under civil service, while 6 were not. Whether it is significant or not, being based on a comparatively small number, it is nevertheless interesting to note that the average time in their present positions, of the civil service chiefs, was 14.6 years, while of the non-civil service chiefs it was 6 years.

All of the deputy electrical inspectors are under civil service except four, a slightly greater proportion than in the case of the chiefs.

Duties of District Inspectors: By far the bulk of the work of these men is inspection of work on permits. Some few have duties slightly beyond this as indicated by the answers. For instance, in one case it was the inspection of all poles and wires and pole locations, some were especially on the lookout for bootleg wiring, others checked on the bond and license of

FIVE YEARS' STATISTICS ON SALARIES, REVENUE AND LICENSES

	1929			1930			1931			1932			1933		
	No. Listed	Average Salary Per Month	Average Hours Per Week	No. Listed	Average Salary Per Month	Average Hours Per Week	No. Listed	Average Salary Per Month	Average Hours Per Week	No. Listed	Average Salary Per Month	Average Hours Per Week	No. Listed	Average Salary Per Month	Average Hours Per Week
Chief Inspector.....	10	\$278	42	10	\$281	42	10	\$275	42	10	\$257	42	10	\$237	42
Assist. Chief Inspector.	9	218	42	9	221	37	9	217	42	9	209	41	7	192	40
District Inspectors.....	140	249	43	138	241	43	134	265	43	121	261	42	92	104	41
Re-inspectors (inner fire limits).....				4	195	44	4	195	44	4	195	44	2	164	42
Re-inspectors (outside inner fire limits).....	1	180	44	1	180	44	1	180	44	1	180	44	1	148	44
	No. Ans.	Ave. No. Issued	Ave. Revenue	No. Ans.	Ave. No. Issued	Ave. Revenue	No. Ans.	Ave. No. Issued	Ave. Revenue	No. Ans.	Ave. No. Issued	Ave. Revenue	No. Ans.	Ave. No. Issued	Ave. Revenue
Electrical Permits Issued.....	11	13,008	\$35,039	11	10,990	\$26,579	11	9,228	\$21,264	10	6,899	\$15,606	11	5,146	\$11,204
	No. Ans.	Average No. Issued		No. Ans.	Average No. Issued		No. Ans.	Average No. Issued		No. Ans.	Average No. Issued		No. Ans.	Average No. Issued	
Contractor Licenses Issued.....	7	131		7	285		7	278		7	264		7	242	

electricians, investigated complaints, etc. There was some indication of re-inspection work, but under present conditions it is relegated to a minor activity. To be explicit, seven mentioned re-inspection work, and of these, three stated that it was upon request or when time permitted. It will be seen in the table of year by year activities that in 10 cities forming the basis of that study, there were only five men definitely assigned to re-inspection work exclusively, during the period from 1929 to 1933, inclusive.

Inspection of Non-Electrical Work: It was found that the work of the electrical inspector was confined wholly to the electrical department of inspection. In one case, only, it was mentioned that the work of the electrical inspector was extended beyond his regular province, by having him police all crafts.

Automobile Allowances: A bare

majority of electrical inspectors use city cars. In eight cases, inspectors used their own cars, with varying compensation for their operation as follows: Sign inspectors, only, \$72 per month; flat, \$13 per month; furnish gas only, no other compensation; 8 cents per mile, with a limit of \$35 per month; to men, chief gets 6 cents; flat \$20 per month; 5 cents per mile, with \$45 a month limit; \$25 per month; \$450 per annum.

An effort was made in this survey to ascertain the trends in certain factors over a period of time including the years 1929 to 1933, inclusive. There were a number of questions asked in this part of the survey which called for more or less elaborate statistical information. Among the reports were 10 that had this information sufficiently complete to permit of analysis. Selecting some of the questions that might be of the most interest to electrical contractors, the results

are set forth in averages in the table on the previous page. A table containing each and every answer would be too cumbersome, but the average salary, the average revenue, etc., for the 10 cities, serves as well to show trends over the five year period.

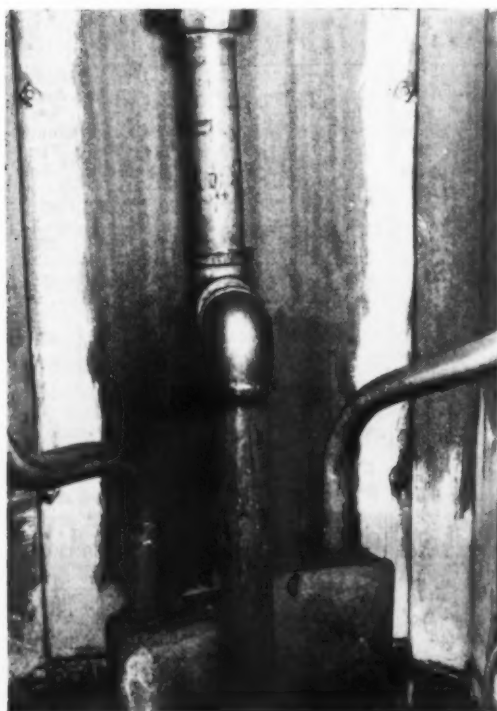
It will be seen from this table, that salaries have gone steadily downward, with but little change in the hours of duty. The tendency, however, is apparently no more marked than has been the case in other lines of endeavor.

The average number of permits fell from 13,008 in 1929 to 5,146 in 1933, while the corresponding revenues fell from \$35,039 to \$11,204.

The average number of electrical contractors' licenses has not varied greatly. Starting with 131 in 1929, the peak of 285 was reached in 1930, and since then there has been a gradual falling off, to 242 in 1933.

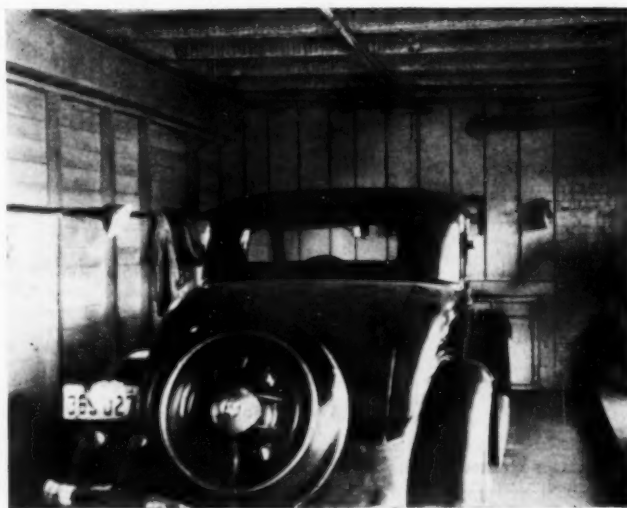
Remodeling Opportunities in Hazardous Locations

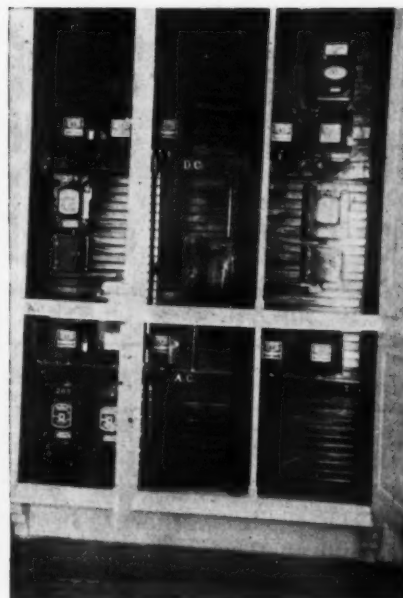
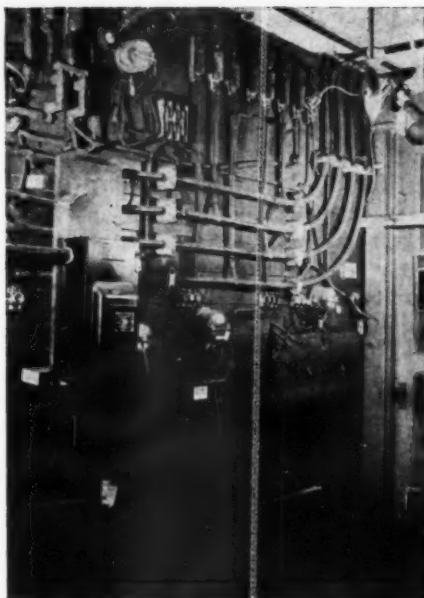
The explosion-proof fittings, control switches, panels and lighting equipment now available provide countless opportunities for change-over. Below are shown two examples of conditions to be met frequently in virtually every city:



At the left we see square junction boxes in a filling station pump base, from which gasoline vapors may follow-up into arc-producing equipment directly above, or feed back to the station panelboard through the underground conduits.

Below is a room used for spraying lacquer finishes on automobiles. Lamps are open type in reflectors, about five feet from floor, and would be in the midst of volatile vapors in case of their accidental breakage.





Selling Safety and Adequacy by Systematic Reinspection

The city of Grand Rapids, Michigan, is being given a systematic electrical reinspection which is bringing about a favorable improvement in obsolete and inadequate conditions. L. R. Strain, chief electrical inspector since August 23, 1934, was formerly a local electrical contractor. Thus far the principal corrections have been made in the business zone and have resulted in the replacement of hazardous and overloaded metering centers and generally defective circuit wiring. While vested with the authority to require the correction of defective wiring, Mr. Strain has followed a plan of advisory and informative procedure. His contacts have been made wherever possible with the object of convincing the owner that the recommended corrections were of vital importance to property protection, economical operations, lessened upkeep and safety. Although the Grand Rapids electrical inspection department includes also two deputy inspectors, Mr. Strain has followed up all major citations personally from the time they were recorded.

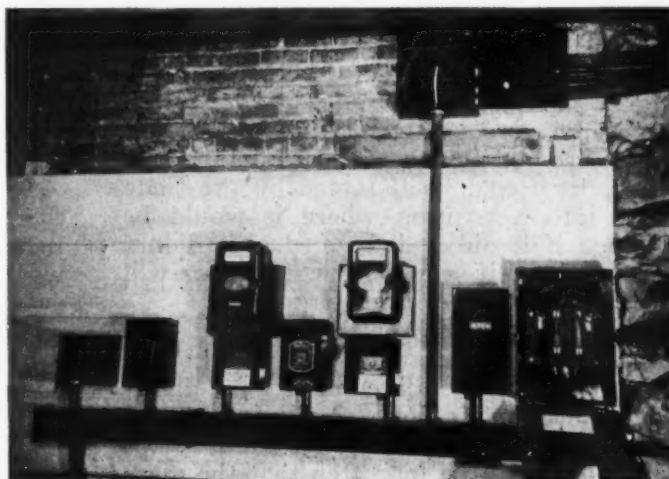
Electrical Contracting, November, 1934

(Left) A patched-up distribution and metering center as in this loft building basement is a fit subject for reinspection. This job is being figured at this time as a result of a citation from the inspector.

(Middle) On making additions some jobs are made very unsightly through sloppy methods. In this photo a group of loomed wires are draped from ceiling to conduit boxes, when a neat job could have been done originally. The owner is now having this condition cleaned up by a licensed electrical contractor, after it was pointed out by the inspector during a reinspection survey of the premises.

(Right) This closet is typical on several floors of an office building. Before correction the equipment was a patched-up maze of wood molding, tangles of open wiring and some poorly installed armored cable and conduit, with obsolete and overloaded switches. A good example of planning for future tenants with modern flexible metering facilities.

(Below) An uncompleted meter board and distribution center which is replacing a tangle of overloaded and exposed metering equipment that was found by reinspection.



electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

MINIMUM OVERHEAD

THE Code Authority in the accounting and cost finding procedure, which it has been required by the Code to set up, has established a minimum of 15 percent overhead to be added to labor, material and job expense in order to arrive at cost.

There are two schools of thought on the subject. One side has hailed a standard minimum overhead as almost a millenium. They contend that the man who works out of his house claims to have no overhead and, therefore, adds none. To recognize a minimum in the operation of the Code would bring this fellow in line in competition.

The other side contends that establishing a minimum is virtually the same as making a maximum, that overhead is not something that can be standardized. They point out that the small operator may need 25 or maybe 35 percent, whereas some of the very large operators can do business on as low as a 10 percent overhead.

The objection to a standard overhead on labor and materials on all jobs is answered by the Code Authority with an alternative of 38 percent on labor only. Therefore, on industrial jobs a contractor need add nothing on the material cost except what profit he desires.

We are very much afraid that the Code Authority found itself forced by the Code itself into a position where it would be damned if it did and damned if it didn't. It is doubtful if very many contractors will approve of the action in its entirety.

However, in spite of the fact that it is admitted that the same overhead cannot apply to business of different size and different nature and in spite of the fact that a minimum can very easily become a maximum, let it not be forgotten that the mere

fact that a percentage must be added for overhead will be an education to thousands of small contractors. These men will find it less easy to compete on price. This minimum overhead will not affect the larger operator but it should materially improve the competition of the smaller operators if compliance is observed.

Moreover, it is possible, that this might be sufficiently unpopular to warrant the Code Authority finding out what overhead really is and how it can be applied without using higher mathematics. If it accomplishes that one thing alone it will have been worth all of the trouble.

CREATE PUBLIC DEMAND

REPORTS from several sources seem to indicate that the amount of modernization and repair work stimulated by the Federal Housing Act is disappointing. It was thought that the big stumbling block to this work was financing. Now that easy financing has been made available, it is found that the public does not sense the need for having this work done, at least at this time.

Therein lies the big opportunity for the Federal Housing Administration. The public must be sold. It is a stupendous job of sales promotion with the necessity of reasonably quick results. The Administration, however, has some excellent publicity talent and this should be loosened on the public with full force. The results are going to be discouraging for some time but the work must go on.

The building industry has never been merchandisingly minded except in the sale of speculative houses. The entire market of repairs and maintenance has never, except for a few instances, been pushed. People know that when they get a queer noise in their car they must have it looked after at once, but they feel that it makes little difference whether a house repair is made now or next year some time—if then.

Somewhere in the files of the industry there must be a tremendous amount of data that presented in the form of case studies would show the public how costly it is to defer repair work. Ideas must be worked up to show people why this work must be done now. That is the important factor—not so much that the work must be done, but done now.

As an industry we have been too much in the past concerned with new construc-

tion. Right now we are very much interested in repair work, but unless a public demand is stimulated, the industry will again forget repair possibilities when new construction returns.

This will be unfortunate for the building construction industry because normally repair and remodeling work is very profitable and is not subject to strong competition.

QUANTITY PRODUCTION

AN interesting piece of work is going forward in Detroit, namely the changeover by contractors for the utility company of inside meters to outside on a quantity production basis. The details of the work are shown elsewhere in this issue. These changeover jobs are being done at the flat rate of \$5.50 per meter with the contractor furnishing everything but the meter and meter enclosure. Of this \$2.50 is labor leaving \$3.00 to cover materials, job cost and profit.

This work is interesting from many angles. In the first place, labor has cooperated by giving a flat price per meter of 2 man hours and the men are meeting this schedule very comfortably. With such a small price per job there had to be some labor standard. Had labor not made this standard it is doubtful if the work would have gone ahead. It involves nearly a million hours of mechanics' time.

The second point of interest is that the contractors are doing this work for from 50 to 100 percent less than it is being done by other utilities even with their lower priced labor.

Thirdly, this work is being done by only a few contractors. Had the work been spread out among thirty or forty contractors everyone of them would have lost money. With a large volume of work it is possible to have specially trained crews and methods for securing production.

The lessons learned in this work should be helpful in other mass work that the utility has to give out. Installation costs can be cut if the work permits quantity production methods.

Contractors in other sections might find it possible to sell a similar idea to their power companies. Of course, now is an ideal time to do such work because there is no other large volume of work to interfere. It can be done much cheaper today than it will be possible to do it a year or two from today.

N.E.C.A. MEMBERSHIP

MEMBERSHIP in the National Electrical Contractors Association is now at its all time peak, nearly 3,000 members. The Code of Fair Competition, of course, has been largely responsible for this fine increase and the work that the Association did in securing the Code, and afterwards in financially and otherwise assisting the Code Authority to function, warrants this larger membership.

Nevertheless, the appreciation of a large group of people is short-lived. That the N.E.C.A. only could get a Code for the contracting industry is of little importance to the average individual. He may recognize what has been accomplished in the past, but he does not like to lay his money down on the line until he knows what he is going to get now.

For that reason the N.E.C.A. must consider additional programs if it is to hold and strengthen its membership. The officers of the association have been extremely busy on Code matters but they are now considering some new plans for the association. The association, of course, has not been quiet all these months since the Code was signed. There was no small amount of work to do for the Code Authority and there was also the very important undertaking of trying to secure a recognition of the contractor in the manufacturers' price schedules. Additional programs, however, can and will be undertaken which will be of lasting value to the industry.

Finally, one more step needs to be taken by the association and that is to sell itself to its membership. The association has been too content to let its accomplishments speak for themselves with the result members lost interest. Association work, after all, is seldom something that quickly touches the individual. One, therefore, has to be inspired to maintain his association affiliation especially in a national organization, the offices and officers of which he seldom if ever sees.

The N.E.C.A. members can be proud of their association and their membership, but they do not know why. The association, therefore, must tell them. The publicity to the membership need not be expensive but it must be continuous and it must be constructive. If the members are told what the association is and what it is doing and are kept inspired, there will be no lag in membership.

\\ code chats //

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

FIXTURE WIRE FOR MOGUL SOCKETS

Can mogul sockets be connected to circuit wiring using No. 16 or No. 18 fixture wire?

Rule 2008-a (1) requires that the circuit wires supplying mogul sockets be not smaller than No. 12.

Rule 2008-b requires that where the protective devices of such circuits exceed 15 amp. the fixture wire be not less than No. 14.

This would then imply that No. 14 fixture wires on such circuits would be protected by up to 40 amp. protective devices and would imply that where fuses of 15 amp. or less were used smaller than No. 14 taps would be used and we would, therefore, refer back to rule 806-1 which allows No. 16 or No. 18 fixture wire to be protected by 15 amp. fuses. Note that such taps are restricted to 18 in. lengths by the final sentence of paragraph of 2008-b.

TROUBLE LAMPS

Does the Code require that all "trouble lamps" be equipped with handle and guard?

This is covered by rule 1405-b of the Code. The reference in this requirement covers all portable lamps but in the normal use of table lamps, floor stand lamps, etc., the bulbs do not come in contact with flammable material and, therefore, do not need the special precautions.

But as the "trouble lamps" or "hand portables" from the very nature of their use, are often laid on a wood floor or otherwise come in contact with combustible material, they must, under 1405-b be equipped with handle and substantial guard.

As many fatalities have occurred through the use of defective "trouble lamps", the use of plain unguarded brass shell sockets should be avoided.

UNDERGROUND FEEDERS

Can feeders run underground be rubber covered, Type R, run in rigid conduit without being lead covered?

This is covered in rule 503-p which very clearly requires that for underground conduit work the conductors be lead covered unless of "other type specially approved for the purpose", which means of the service entrance cable type.

GROUNDING OF PORTABLES

Why should not all portable equipment having exposed metal parts be grounded regardless of the voltage? Present regulations require this only on over 150 volts to ground.

The main reason such a requirement is not in the National Electrical Code is that the lack of a ground on portable equipment is not as a rule much of a fire hazard, although it often is a serious life hazard. The Code, in other words, is written chiefly to prevent fire hazards.

In quite a few places, local ordinances require the grounding of all portable motors and some other portable equipment. Such procedure is certainly to be recommended for it is much better to prevent the loss of a single life, or injury to one person, than to save the small cost of grounding portable equipment.

Let us hope that those opposing requirements for the grounding of portables see their way clear to cease such opposition.

RUBBER COVERED WIRES FOR SERVICE WIRES

Will rubber covered conductors in rigid conduit comply with provisions of paragraph "d" of Section 404 relating to protection from moisture?

No. Where wires are installed in conduit underground there is sufficient air around the wires to allow moisture to be condensed inside the conduit which moisture has little chance to escape. For protection against this lead covering over the wires is required.

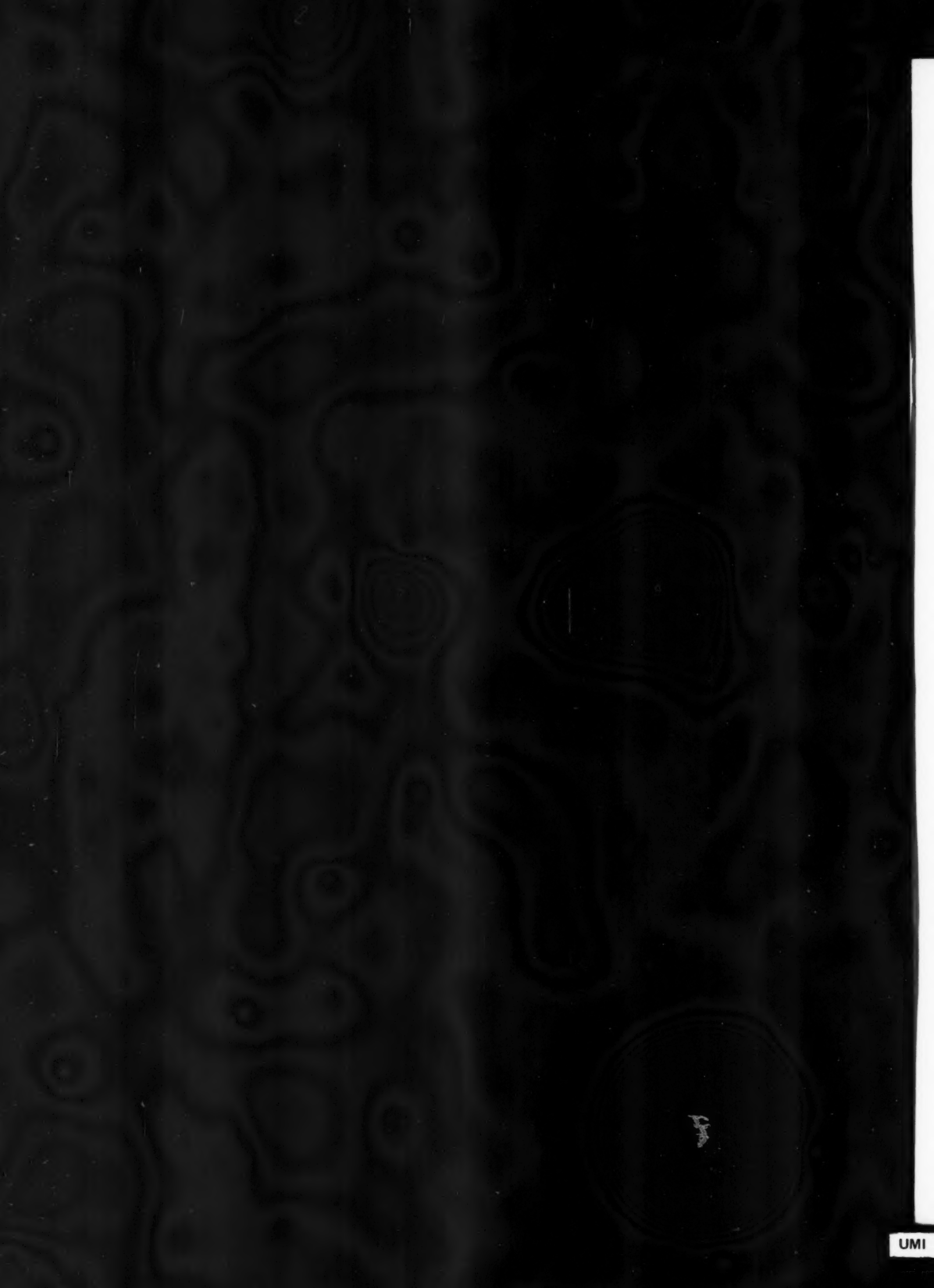
The "other means approved for the purpose" refers to the make up of the approved service entrance cables as approved by Underwriters' Laboratories. In the assembly of these cables no air space is left where moisture can collect, and all materials used are treated so as to be moisture repellant. The conduit therefore does not afford protection against moisture as required by section 404-d but it does provide mechanical protection.

BRASS SHELL SOCKETS

Why do some inspectors give me a violation on brass shell socket where I use a 100 or 150-watt lamp, although the socket is marked "250 watts"? Why cannot I use a 250-watt lamp in a brass socket?

Much trouble and some fires have been caused by the fibre socket linings of brass shell sockets becoming carbonized from the heat of the present day incandescent lamps and then causing short circuits between the screw shell and the socket cover where the socket has not been polarized. For this reason, many inspection departments are prohibiting the use of

Electrical Contracting, November, 1934





**UNITED STATES
RUBBER COMPANY**

announces

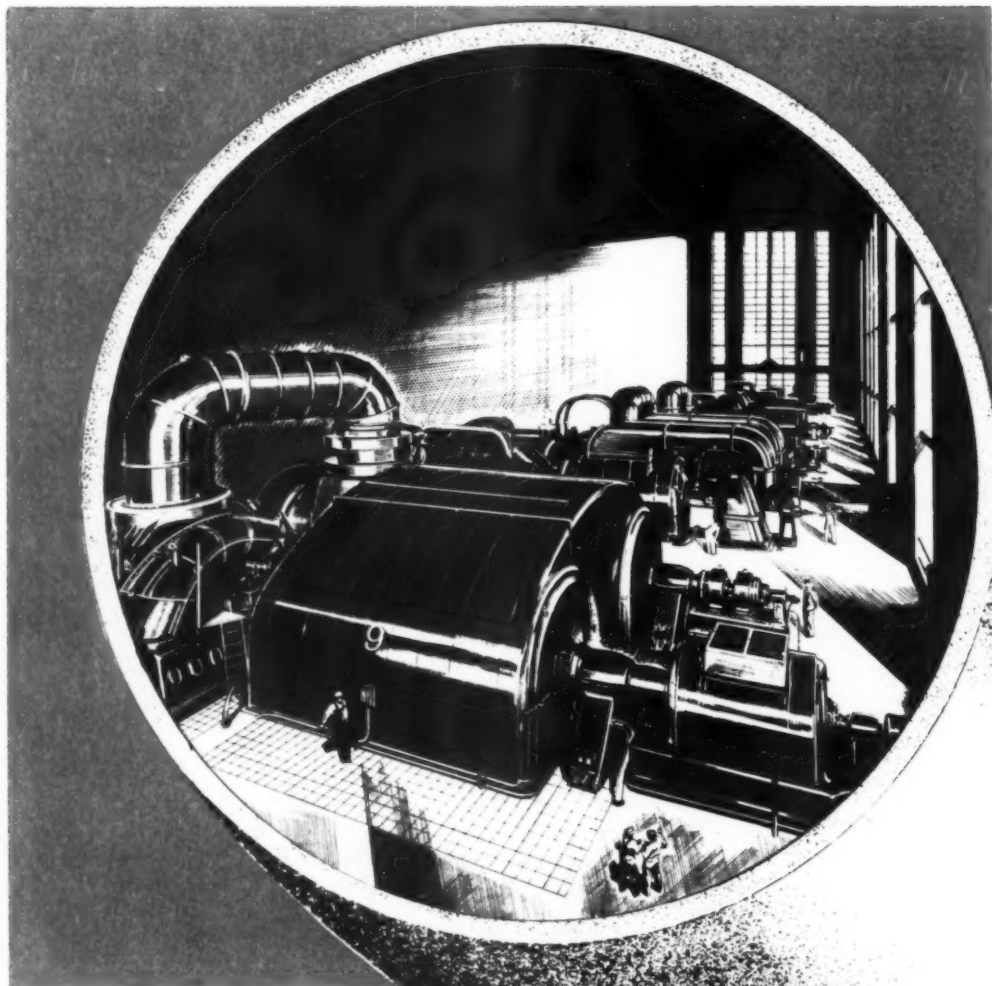
**A NEW BARRIER
AGAINST WASTE..**

a new

**CONSERVATOR
OF POWER**



A Revolutionary Ne



Laytex

UNITED STATES RUBBER COMPANY •

New DIELECTRIC

revolutionary in

TENSILE . . . FLEXIBILITY

INDUCTIVE CAPACITY . . .

DIELECTRIC STRENGTH

WEIGHT . . . ELONGATION

CENTERING . . . BULK . . .

UNIFORMITY . . .

*For full information
of this remarkable
new DIELECTRIC
see following page*



Y • LEADER IN LATEX DEVELOPMENTS

Physical and Electrical Characteristics of *Laytex* the *NEW* Dielectric

Electrical Properties

Dielectric Strength

The dielectric strength of Laytex is 800 volts per Mil.



Insulation Resistance

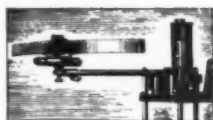
The insulation resistance constant for Laytex is: $K = 54,000$ in the formula:

$$R = K \log_{10} \frac{D}{d}$$

R = insulation resistance in meg-ohms per 1000 feet

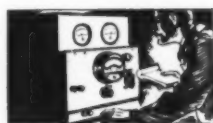
D = diameter over Laytex insulation

d = diameter of conductor



Specific Inductive Capacity

The Specific Inductive Capacity of Laytex is 2.5



Moisture Absorption

Moisture absorption of Laytex by change in Specific Inductive Capacity method.

Specific Inductive Capacity one day in water not to exceed 4.0

Increase in Specific Inductive Capacity at the end of first to fourteenth day not to exceed 10.0%

Increase in Specific Inductive Capacity at the end of seventh to fourteenth day not to exceed 4.0%



Physical Properties

Tensile Strength

Laytex has a tensile strength of 5000 lbs. per square inch.

Elongation

The elongation of Laytex, at rupture, is 750 per cent.

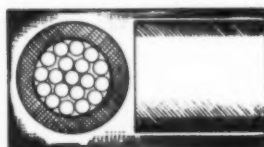
Set

Laytex has a set of $\frac{1}{4}$ inch in two inches stretched to 10 inches; release; one minute interval prior to measurement.



A NEW Process of Insulating

The unique dip or pass method of insulating utilized with LAYTEX gives:



Perfect Centering of Conductor.

Uniform Wall Thickness of Dielectric.

Homogeneous insulation structure, built by lamination.

Combining Laytex and this new process, results in wires and cables that are lighter in weight and smaller in bulk.



United States Rubber Company

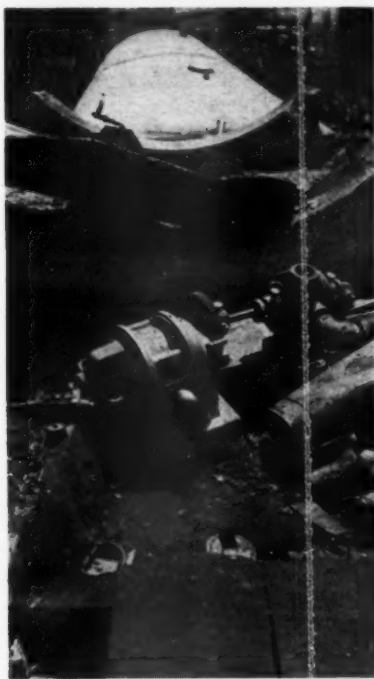


1790 Broadway, New York City

brass shell sockets with lamps of 75 watts or over. They do not mean that a 250-watt socket is not capable of carrying 250 watts of electrical energy, but do consider that so much heat is generated by a lamp of 75 watts or over that the fibre socket lining is damaged.

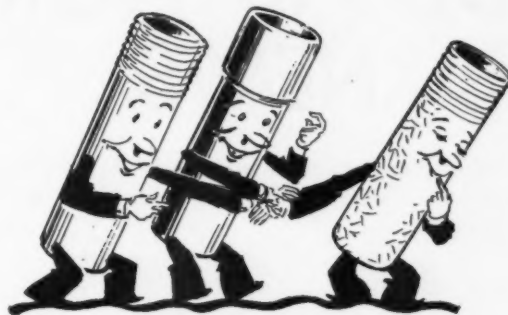
Of course, shorts between the screw shells and outer shells would not occur if the wiring and sockets were polarized, but unfortunately this is not always done. On the other hand, the Code requires the socket lining to be of an insulating material and a carbonized lining, especially if it has absorbed a little moisture, is not a good insulator.

Therefore, it is best to use porcelain or bakelite sockets where heat is to be encountered.



**EXPLOSION-PROOF WIRING RULES VIN-
DICATED:** A grim reminder of the need for strict compliance with Article 32, Class I hazard rules is contained in a recent report which appeared in the July NFPA Quarterly of a bulk oil distributing plant fire and explosion near Jamestown, N. Y. Four firemen and three spectators were burned to death, while a hundred or more suffered burns. An explosion occurred and fire broke out in a pump-house, after starting up an open commutator type gasoline pump motor equipped with nonapproved starting equipment. The fire spread rapidly, heat from burning gasoline on ground generating internal pressure and rupturing two horizontal tanks of 10,000 gallons and 20,000 gallons capacity. Firemen and spectators were enveloped in a wave of blazing gasoline from which few escaped without injury.

WE INTRODUCE



PITTSBURGH STANDARD HOT-DIP GALVANIZED CONDUIT *with Threads Zinc Coated*

The only weak spot of Hot-Dip Rigid Conduit — **THE NAKED THREAD** — now thoroughly protected with zinc and with a smooth finish.



The exterior and interior of this new Pittsburgh Standard Conduit are both Hot-Dip Galvanized. The threads are zinc-coated by a process that produces a smooth finish (patent applied for). The interior is additionally protected by a Linseed Oil base Enamel applied over the zinc to insure a smooth and non-soluble raceway. The exterior is super-coated with a clear-acid-proof enamel. Complete double protection, inside and out.

ENAMELED METALS CO., Pittsburgh, Pa.

Also manufacturers of

Pittsburgh Standard Electro-Galvanized Conduit
Pittsburgh Standard Thread Protected Enameled Conduit

CODE AUTHORITY NEWS

Material for this Department is furnished by The Electrical Contractors' Code Authority headquarters staff.

L. E. Mayer, Chairman,
569 W. Van Buren St.,
Chicago, Ill.

E. N. Peak, Vice-Chairman,
Marshalltown, Iowa

A. J. Hixon
Boston, Mass.

D. B. Clayton,
Birmingham, Ala.

L. W. Davis, Executive Officer,
420 Lexington Ave.,
New York, N. Y.

J. G. Livingston,
New York, N. Y.

W. W. Ingalls,
Miami, Fla.

Lloyd Flatland,
San Francisco, Cal.

W. A. Ritt,
Minneapolis, Minn.

R. W. Hodge,
Kansas City, Mo.

R. L. Jacobs,
Houston, Texas

The Code of Fair Competition for the Electrical Contracting Industry is sponsored by the National Electrical Contractors Association

Cost Finding System Approved

The Executive and Finance Committees of the Code Authority met at headquarters in New York October 22 and 23 with L. E. Mayer, chairman, presiding and these other members present: Executive Committee, Earl N. Peak, Alfred J. Hixon; Finance Committee, John G. Livingston, William A. Ritt; Administration Member, Jeremiah D. Maguire; Secretary, Laurence W. Davis.

An Accounting System and Method of Cost Finding for the Electrical Contracting Division of the Construction Industry was formulated and approved and submitted for the approval of the Administrator in accordance with the provisions of Section 4, Article IV, Chapter VI of the Code.

The outstanding feature of the system is that to the aggregate sum of materials, labor and direct job costs and expenses "shall be added as an overhead charge a sum that shall be not less than 15 per cent" of those items of "not less than 38 per cent of the labor" as defined in the system, "and the gross sum of all these items including the overhead charge shall be the estimated cost, to which the contractor may add such profit as he may deem proper, provided, nevertheless, that no bid shall in any event be submitted for any job which shall be less than the estimated cost based upon the aggregate items herein contained."

This system provides that materials shall be priced at not less than the market prices, that labor be not less than provided for in the code or in area agreements and that direct job expenses shall include:

- (a) All drawings or other special services applicable to the job.
- (b) All freight or express charges, plus cost of cartage for delivery of materials from place of delivery to the job.
- (c) Transportation and hotel expenses of superintendent, foremen, mechanics and/or helpers if chargeable to the job.
- (d) Pro-rata charges as may be specified.
- (e) Any costs for telephone, watchman, storage or other special services chargeable to the job.
- (f) Municipal permits and inspection fees chargeable to the job.
- (g) Workmen's compensation, public liability insurance and other insurance as may be required.
- (h) Code Authority assessment of 1 per cent of estimated cost of labor required for the execution of the job or contract.
- (i) Fee for registration of job or contract, as approved by the Administrator for support of local administrative committee in the area within which the job is located.

To the sum of these three is to be added an overhead of at least the amount above specified and after that whatever profit the contractor deems proper.

The work sheets on which these costs were made together with the estimate are to be kept by the contractor for at least one year from the date of submission of the bid.

Fees in Overlapping Jurisdictions

The Code Authority voted that where contracts involve work extending into the areas of two or more local administrative committees, the registration fees shall be divided in proportion to the volume of work located in the respective areas. The local administrative committee receiving the registration fee shall be responsible for remitting the proper share of such fee to the other committee or committees.

Estimating Manual Approved

The Estimating Manual compiled and published by the National Electrical Contractors Association was adopted by the Code Authority and it was voted to submit it to the Administrator for his approval as a manual for the basis of estimating capable of use by all members of the industry in accordance with Section 4, Article IV, Chapter VI of the Code.

This manual, regarded by the Code Authority as the most complete and practical estimating guide, and including complete estimating tables and labor data, is now available to all members of the industry at cost price, and is included without charge as part of the membership services to all members of the National Electrical Contractors Association.

Single or Non-Competitive Bids

The Code Authority voted to amend the rule governing filing of single or non-competitive bids (Section 5-7, Par. B [2] as published in Bulletin 5) so that if a second bid is not received and the bid is returned to the bidder without having been opened, the local administrative committee shall retain the filing fee to cover the service of the bid depository and the committee in handling the bid.

Trade Practice Complaints Machinery Approved

NRA has approved and authorized the trade practice complaints plan adopted and submitted by the Electrical Contractors Code Authority. Full authority now rests in the various agencies of the Code Authority, designated as trade practice complaints committees, to act upon complaints brought before them, to appoint boards of review if necessary to in-

WE ARE CO-OPERATING
with

BETTER HOUSING PROGRAM
FEDERAL HOUSING ADMINISTRATION

NEW BUSINESS FOR ELECTRICAL CONTRACTORS

Use General Electric Wiring Devices to help you enter the vast modernization market now opening up under FHA. There are G-E Wiring Devices for every purpose. They are easy to install, dependable, and economical.

WIRING DEVICES

FHA is making it possible for your prospects to start long-neglected modernization work. Get your share of that work. Other trades are competing for it. G-E Wiring Materials are safe, modern, adequate. Your prospects demand their protection... their quality. Obtain complete information today. See your G-E Merchandise Distributor or write to Section DW-1911, Merchandise Dept., General Electric Co., Bridgeport, Conn.

A wiring system using General Electric Wire and Cable has the strength and dependability that insure years of satisfactory use. Six colored braids identify circuits. G-E Building Wires will help you on modernization jobs.

WIRE AND CABLE

GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

REG. U. S. PATENT OFFICE

ELECTRUNITE Steeltubes

ELECTRICALLY



• WELDED •

DEARBORN ELECTRICAL CONSTRUCTION COMPANY
CONTRACTING ENGINEERS
One North La Salle Street
CHICAGO
Sept. 12, 1934

TELEPHONE STATE 0197-0198

Electrical Division
Steel and Tube, Inc.
224 E. 131st St.
Cleveland, Ohio

Attention: Mr. M. J. Whitfield
Manager, Conduit Sales

Gentlemen:

In answer to your request for comment on the "Electrunite" Steeltubes which you furnished to us for use in connection with the St. Paul Post Office and Custom House Building, we are pleased to advise you that we had wonderful success in making this installation.

After having installed in excess of 180,000 feet of your Steeltube on this job, we have concluded that it's production is a decided forward step in the electrical industry, both from an economic and a practical viewpoint.

We anticipate using it extensively in the future.

Very truly yours,

DEARBORN ELECTRICAL CONSTRUCTION CO.
BY *Henry Sell*



" a
forward step
in the electrical
industry "

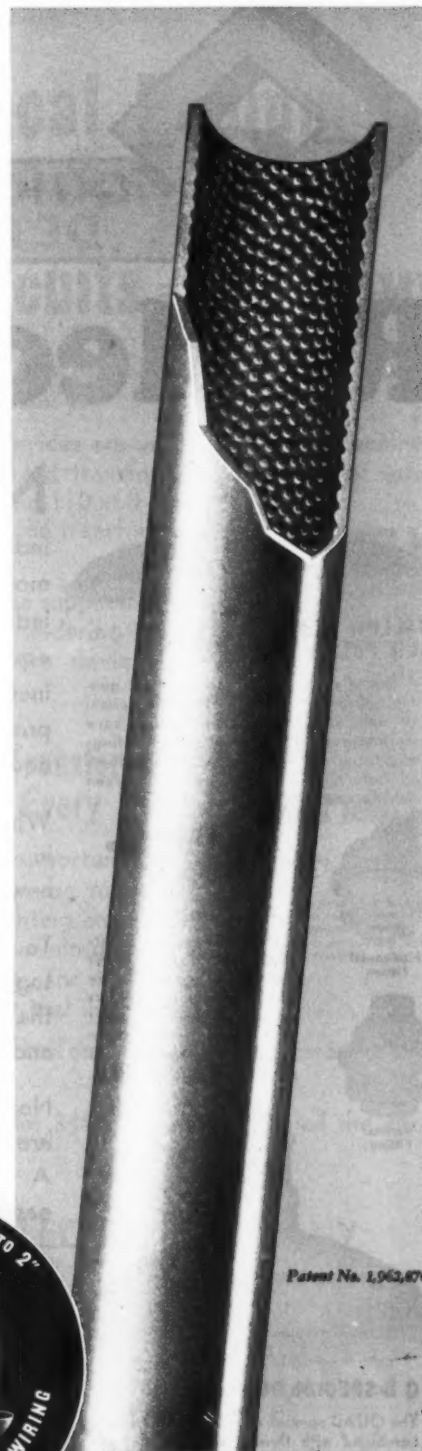
Steel and Tubes, Inc., shattered precedent when it introduced ELECTRUNITE STEELTUBES with the new knurled inside surface. That it was a step forward in the electrical industry is being proved every day by the experience of users.

ELECTRUNITE STEELTUBES retains all the advantages of the original Steeltubes electrical metallic tubing—light weight, fast cutting, easy bending, no threading, simple connections, complete mechanical and electrical protection—but now, with thousands of tiny ball-like projections on the inside surface, it presents another advantage—it is the easiest wiring conduit in the world. And with all couplings and connections furnished, it costs less to buy than threaded conduit.

Contractors who are anxious to take a step forward toward increased profits should investigate this modern electrical metallic tubing—should find out how it helps to bring in profitable work. Write for more detailed information.



Knurled inside finish available in $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1" sizes.



Electrical Division
STEEL AND TUBES, INC.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND • • • OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION



Reflectors



**SHALLOW BOWL
WITH PULL SOCKET**

A line of shallow bowl reflectors for general purpose lighting. These practical as well as economical reflectors have weatherproof cast aluminum fittings which permit their use either outdoors or indoors—Porcelain enameled green outside and white inside.



Horizontal
Fitting



B Fitting

These fittings are interchangeable and permit the use of both shallow bowl and dome reflectors shown as well as other Q D Reflectors and globe holders. Reflector sizes range from 8 to 16 inches.



Vertical
Fitting



Q D SPECIAL DOME REFLECTOR

The QUAD special dome reflector when combined with three different types of socket fittings provides a wide range of applications. This reflector is strongly constructed and is weatherproof. Sockets easily wired and reflectors can be quickly attached and removed without disturbing wiring. For more intensive lighting, these economical lighting units can be more closely spaced.

NOW is the time to push for sales in outdoor and industrial lighting. Plants need modernizing. In hundreds of industrial plants the present equipment is antiquated and inefficient. These are excellent prospects for new lighting equipment and wiring jobs.

Why not go after every plant in your locality? Sell them new lighting.

To make your sales job easier suggest Q D reflectors—a line that has superior construction and more lighting efficiency.

Not only that—Q D reflectors are economical in first cost. A Q D job is a better job—easier to sell at a long profit.

Ask us for full data on the complete line of Q D reflectors.



**QUADRANGLE
MANUFACTURING CO.**

30 South Peoria St. Chicago

investigate complaints, and to determine whether such complaints are to be referred to higher authorities for action.

CODE EXPLANATIONS

No. 28—Substantial Change in Plans or Specifications

Article VII, Section 10

On a project where bids had previously been received, the question was asked whether changes made in gross figures which would amount to not more than 10 per cent of the bid price would constitute a substantial change in the plans and specifications, so that the project might not be readvertised until 30 days had elapsed since the original bids were rejected.

The last sentence of Section 10 of Article VII reads:

Where all bids are rejected, bids shall not be again invited or submitted for the mere purpose of obtaining a lower or revised price or prices for substantially the same work previous to the elapse of ninety (90) days from the date of such rejection, except there be a substantial change in the plans and/or specifications, or except there be evidence of collusion, or except there be such a marked difference between the bids submitted and the awarding authority's estimate as to the valuation of the work as would indicate to the awarding authority and his Code Authority the necessity of new bids in order to secure fair competition.

There are three modifying conditions defined in this section under which bids may be again invited or submitted previous to the elapse of 90 days from the date of rejection of the original bids, one of which is a substantial change in the plan and/or specifications.

It will be noted, however, that the existence of any one of the three modifying conditions must be agreed upon by the awarding authority and his code authority, which joint confirmation is not mentioned in the question submitted.

The Construction Code Authority held that "It is impracticable to fix a minimum percentage of change in the estimated cost of a project defining for all construction projects a substantial change in the plans and specifications justifying the inviting or submission of new bids previous to the elapse of 90 days from the rejection of the original bids; it is the joint responsibility of the awarding authority and his code authority to determine whether a substantial change in plans and specifications has been made."

All Electrical Equipment Placed on Power Circuits = Economy

Here is a real opportunity of creating business for yourself and saving your customer money.

If lights or electrical devices are used at motored machines, connect a Jefferson air-cooled transformer to the "lower rate" higher voltage power line and 110 volt current will be delivered from the transformer for their operation.

Groups of circuits can be supplied with 110 volt current for lights, soldering irons, drills, and small motor-driven devices or for remote control circuits.

Jefferson Air-Cooled Transformers Will Save Money in Every Plant

In every plant there are opportunities to point out how savings can be made by connecting more of the lighting and small-devices load onto the higher voltage power circuits. The savings will pay for the transformers and your materials and installation costs.

Jefferson air-cooled transformers are listed as standard by Underwriters' Laboratories.

Get our latest pamphlet 341-PCT which gives all the information and data.

JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois

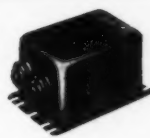


Individual Compartments for Connections

Cover broken away to show primary leads in one compartment and the secondary leads in another—both completely covered when installed.



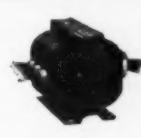
Jefferson Neon Tube Transformers are made for both indoor and outdoor signs.



Loading oil burner manufacturers insure operating performance with Jefferson Transformers.



For signal systems, relay systems, Jefferson's have long been known for their dependability.



In connection with control mechanisms, Jefferson Transformers are built to meet the most exacting requirements.



For decades Jefferson Door Bell Transformers have responded to the touch of millions of fingers.

CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS
CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL
IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO
THIS DEPARTMENT

CHICAGO AREA AGREEMENT SIGNED BY PRESIDENT

The labor agreement covering the Cook County, Illinois, area, in which is located Chicago, was signed by President Roosevelt on October 22. The agreement prescribes the hours, wages and working conditions for all those covered by the electrical contractors' code.

Three wage scales are set up: Class A, \$1.50 per hour; Class B, \$1.00 per hour (maintenance and repair work); modernization work, \$1.06¼ per hour. The latter scale applies only to modernization work done by contractors signing the modernization plan agreement to solicit this work and employ at least two men on this class of work for 40 hours a week. It does not apply to any work where more than four trades are employed.

The agreement has no jurisdiction over building or factory electrical workers who have been employed in those buildings or factories continuously for six months or more as maintenance men or house electricians, otherwise these men must comply with the agreement.

SEEK WISCONSIN INDUSTRY CODE

A state code of fair competition to regulate the electrical contracting and motor repair industry is sought and sponsored by the Wisconsin Association of Electrical Contractor-Dealers. Its principal objectives involve the establishment of uniform practices for the motor repair industry (now without a national code), state licensing for those in the electrical contracting and motor repair industry, and uniform opening and closing hours for all shops in a community.

Application was made for this legislation to the Industrial Commission of Wisconsin, and as a result this body on September 12, 1934, addressed a confidential questionnaire form to 780 firms of record within the state. Incomplete returns at this time indicate a large percentage of firms as having gone out of business. However, of those in business, a decided majority expressed a desire for the establishment of this proposed code.

A state-wide industry survey will have been made when the forms as submitted by the Industrial Commission are all received. Fourteen questions are submitted as follows: (1) Whether in favor of a state code, (2) whether in favor of state licensing, (3) age of owner and/or manager, (4) number of years operations, (a) contracting, (b) repair shop, (5) number of employees as of 9/1/34 in (a) four classes of contracting—journeymen, helpers, apprentices, other employees and (b) four classes of repair shop employees—motor winders and repair men, helpers, apprentices, other employees, (6) hourly wage rates paid as of 7/1/34 in each class of question No. 5, (7) number of hours per full day and per full week worked by each class of question No. 5, (8) whether in favor of uniform opening and closing hours, (9) whether a motor repair shop is operated, (10) total gross receipts for 1929-1932-1933 from combined business, (11) total gross receipts for 1929-1932-1933 from motor repair business, (12) whether in favor of a minimum price for rewinding motors, (13) total payroll for 1929-1932-1933, and (14) remarks from respondents.

NEARLY 3,000 N.E.C.A. MEMBERS

There has been a marked increase in membership of the National Electrical Contractors Association this year. From January 1 to October 23 the number of members increased from 2,138 to 2,955. This is a net increase of 38 per cent.

There was a gross membership increase of 1510, but 693 members have been dropped from the rolls since January 1 for failure to maintain themselves in good standing.

Membership increased in 38 states, decreased in only 9, and remained the same in one state and the District of Columbia.

MINIMUM WAGE LAW IN BRITISH COLUMBIA

The British Columbia construction industry is now operating under a minimum wage law. There are two classes: 45 cents an hour in the principal cities and territories and 40 cents an hour elsewhere. For male employees between the ages of 18 and 21 years the minimum rates are 33 and 30 cents an hour.

INDUSTRY GROUPS FUNCTION THROUGH DETROIT ELECTRIC CLUB

The divisional interests within the electrical industry of Detroit, Mich., have maintained their separate status, yet function effectively in coordination with other industry divisions through the Detroit Electric Club, according to F. H. Van Gorder, club secretary-manager.

While league activities most generally include the various phases of the industry and thus in most communities the membership is made up of persons from its various branches, Detroit enjoys a high degree of group organization. In addition to utilities, manufacturers, wholesalers and radio firms, the electrical manufacturers' representatives, fixture dealers and motor repair shops each have a separate organization, which, in turn, is recognized in the Electric Club as an active industry division. Electrical contractors numbering about 400 are also identified in the club by three groups, the Detroit Chapter, N.E.C.A., Thomas A. Edison Club, and the Steinmetz Club, while labor is also identified through active electric club memberships. Electrical inspec-

Within this Cover

is the whole story of WIRING DEVICES

Up-to-Date!

-all information
on the most
COMPLETE Wiring
Device Line



Up-to-date List Prices are given in the combined PRICE LIST AND INDEX in the colored section in back of book, providing for revised price information at all times. This new Catalog will serve you indefinitely — with reference to every Wiring Device you will use. Mail Coupon for your copy.

ARROW ELECTRIC DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

To
ARROW ELECTRIC DIVISION
HARTFORD, CONN.

Send your new Complete
Wiring Device Catalog to —

(Your name) _____

(Name of company) _____

(Address) _____

(Town & State) _____

BULL DOG FRICTION TAPE

IT STICKS!
IT HOLDS!
IT LASTS!



In four sizes

1-oz. rolls

2-oz. rolls

4-oz. rolls

8-oz. rolls

The 1-oz. and 2-oz. rolls are packed in display containers holding 2 lbs. The 4-oz. and 8-oz. rolls in containers holding 4 lbs. All Bull Dog Tape is packed 48 lbs. to the shipping case.

BOSTON WOVEN



TTrue to its name, Bull Dog Tape has the stubborn, rugged qualities which have made the bull dog famous the world over.

Strong, closely-woven sheeting thoroughly "filled" - - - not merely "surfaced" - - - with live, unvulcanized rubber gives Bull Dog Tape the service qualities which have made it the largest selling brand on the market.

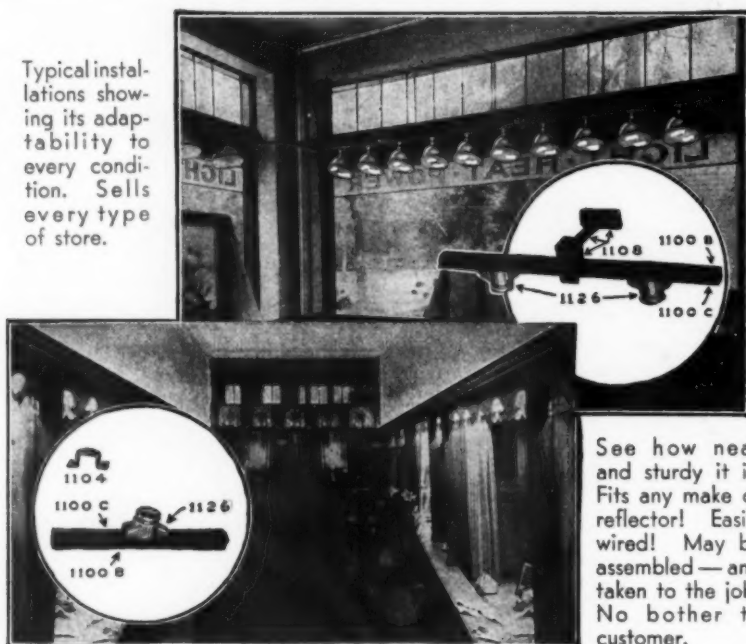
HOSE & RUBBER CO. CAMBRIDGE, MASS.

THE WIREMOLD ZONE

THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 2 OF A SERIES ON WIRING OPPORTUNITIES

Typical installations showing its adaptability to every condition. Sells every type of store.



For instance, see how this neat WIREMOLD LIGHTING STRIP is opening up window lighting opportunities!

Why? Because the simplest system is the easiest to sell — and the most profitable to install.

WIREMOLD Lighting Strip may be installed in a jiffy — in any shape or size of window! And there are hundreds of windows that need it. Wise contractors everywhere are pointing them out and getting the business! **SO CAN YOU!**

THE WIREMOLD COMPANY, Hartford, Conn.



tion matters are tied in through the Michigan Inspectors' Association, to which the inspectors of most communities in Greater Detroit belong.

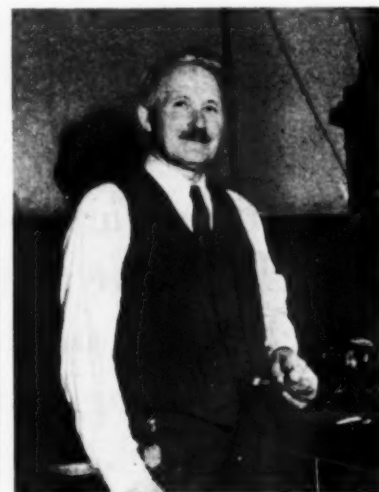
A recent Electric Club activity involves the support of a proposed compulsory electrical inspection and licensing law for the state of Michigan, this law having been sponsored by the inspectors' association.

McGRAW AWARDS FOR CODE EFFORTS

The James H. McGraw Awards for the most outstanding contribution to the electrical manufacturing and to the electrical wholesaling industries was given in both cases to the men who had guided their industries through the struggle to secure a Code of Fair Competition. Walter J. Drury, chairman of the executive committee of the National Electrical Wholesalers Association, was presented with the wholesalers' medal in Detroit on October 16 and three days later in Chicago, John S. Tritle, president of the National Electrical Manufacturers Association, received the manufacturers' medal.

REORGANIZE ELECTRICAL ASSOCIATION OF SCRANTON

The electrical contractors of Scranton, Pa., have recently reorganized and are known as The Electrical Contractors Association of Scranton Area. The officers of the new organ-



HALF CENTURY IN BUSINESS: George Knoerr, of Milwaukee, started out in 1882 as a locksmith, later taking on wiring of door bells, then burglar alarms and electric gas lighters and from that to general electrical contracting.

GET YOUR SHARE OF THIS PROFITABLE BUSINESS

Here's Where You Can Sell G-E Time Switches

YOU will find a wide variety of applications for G-E time switches. Start cashing in on the profitable business they offer, by ordering one of them now. Those listed below are just a few of the many jobs for which they may be used. Check them over:



Show-window and store lighting
Electric signs
Advertising and other displays
Illuminated poster boards

Construction floodlighting
Railway-station lighting
Airport lighting
Airway beacons



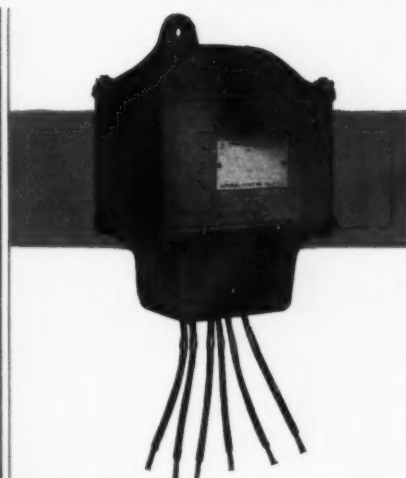
Domestic-furnace installations
Floodlighted buildings
Illuminated monuments
Electric fountains

Alarm and signal systems
Pump-motor control
Ventilating-fan-motor control



Manufacturing processes
Industrial - heating applications
Electrotype-metal heaters
Battery-charging outfits

Apartment house all-night
lighting
Street lighting
Automatic substations



Put Your Customers' POWER Load on the POWER Circuit

MANY 115-volt devices such as small drills, fans, etc. now connected to lighting circuits can be operated from the power circuit by installing small G-E air-cooled transformers for stepping down the voltage.

Your customers will welcome your suggestions for applying these transformers because of the savings made possible. You will find profitable business installing them.

GENERAL ELECTRIC

LET us tell you more about G-E time switches and air-cooled transformers. Simply mail the attached coupon or address the nearest G-E sales office, the G-E Supply Corporation, or the Graybar Electric Company, Incorporated.

General Electric Company
Dept. 6 -201, Schenectady, N. Y.

Gentlemen:

Time Switches ☐

Air-cooled
Transformers ☐

Please send me descriptive and application data on the products I have checked above.

Name _____

Firm _____

Street _____

City _____

State _____

440-51

ALWAYS CUTS WITH UNIFORM EASE



Speed and ease of working are two vital factors in electrical construction. Both mean much to the contractor whose bid has been successful in landing the job—for he has a figure to meet and the difference between his actual cost and that figure is profit.

Fretz-Moon Conduit offers both these factors in substantial quantities. The specially-processed steel of which it is made is highly ductile and free-cutting, yet it affords ample strength for any job. If a thousand cuts were made at different points in different lengths, every cut would be made as easily and fast as every other cut—because Fretz-Moon Conduit is absolutely uniform, physically and structurally. The exclusive, scientifically-controlled "continuous process" by which it is made takes all the guess out of conduit making, and produces conduit absolutely free from hard or "burnt" spots that might cause trouble in working.

There's profit in every length of Fretz-Moon Conduit. That's why contractors who use it once usually continue to use it. Write for details.

STEEL AND TUBES, INC.
CLEVELAND OHIO
EXCLUSIVE SALES AGENTS

FRETZ-MOON

RIGID CONDUIT



BUSINESS DOUBLE NORMAL: At the time of our call on F. W. McGlinch, Commonwealth Electric Company, St. Paul, 60 men were being employed to handle public works jobs going on in the six states of the Northwest covered by this firm. Normally this firm employs 30 to 40 men. This company does a large amount of power plant construction. In addition to his work with the company Mr. McGlinch has been appointed as a member of the local code committee.

ization are John E. Houck, president; D. L. Hammerman, first vice-president; E. A. Howley, second vice-president; Wm. B. McBride, secretary, and Charles M. Barnes, treasurer. The directors are Walter S. Mattocks, W. L. Kinback, Theodore A. Augystyn and Walter English.

L. R. GREUSEL

Louis R. Greusel, president of the Central Electric Company of Battle Creek, Mich., died on October 8 at the age of 50 years. Mr. Greusel established the business thirty years ago in partnership with his brother, Frank Greusel, who later started an electrical wholesaling business in Milwaukee.

Mr. Greusel was also a very active civic leader in Battle Creek, having among other things, served as president of the local Rotary.

P. F. KEELYN

Peter F. Keelyn, who fifty years ago went to Milwaukee and established one of the first electrical contracting businesses in that city under the name of Keelyn and Smith, died on October 8 at the age of 75 years. Mr. Keelyn retired from business twenty years ago.

**EXTREME CROSSWISE RIGIDITY**

No other V-Belt combines such positive crosswise rigidity with such extreme flexibility.

BUILT TO BEND

See how the "cogs" take up the compression on the inner surface of the belt.

GREATER GRIPPING POWER

Sides die-cut—not molded—with raw edge contact surface, give greater gripping power with less tension.

COMPARE

THE DAYTON COG-BELT WITH ANY OTHER V-BELT IN VITAL PRINCIPLES OF CONSTRUCTION

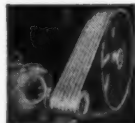
Considering how it is made and what it does, the Dayton Cog-Belt is without a rival in the V-Belt field. Back of it are advanced principles of design and construction which result in superior performance, longer life, and lower operating and maintenance cost.

First, it is the only V-Belt specifically "built to bend." Its patented cog and laminated construction provide far greater flexibility... enable it to flex easily around even the smallest pulley without buckling or rippling.

And while it is more flexible, its laminated construction and patented reinforcement give it extreme crosswise rigidity. There's

no squashing in the pulley groove... no distortion nor twisting. No other V-Belt combines such extreme flexibility with such positive crosswise rigidity.

Added to these important qualities are its die-cut sides. The raw edges of these die-cut sides form the driving surface of the belt... one of the reasons for Dayton Cog-Belt's powerful leech-like grip in the pulley groove. There's less slipping and sliding, even with quick starts and stops... less loss of power... less vibration... less tension... less wear on bearings.



Even a hurried comparison will reveal these advantages of the Dayton Cog-Belt. But there are many more reasons why it is setting new standards of performance in hundreds of industrial plants. Let us show you how it can save money for you in many ways; and especially why Dayton Cog-Belt Drives are the most efficient drives in the world today. Write us.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

Factory Distributors in principal cities and all Westinghouse Electric and Manufacturing Co. Sales Offices

Dayton

COG-BELT DRIVES

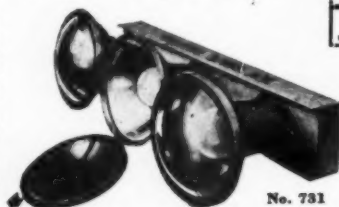
Also manufacturers of Dayton Fan Belts... Dayton Red Tube Radiator Hose... and the famous Dayton Thorobred Tires and Tubes

New IMPROVED Strip Lights

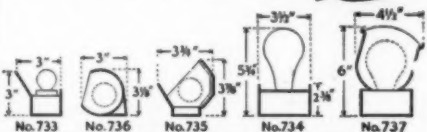
for { COVE LIGHTING
PANEL LIGHTING
BUILT-IN LIGHTING
LUMINOUS BOXES

and other modern forms of interior lighting.

No. 731—a new design, flexible, exceptionally efficient, with many practical advantages. Each unit universally mounted permitting independent adjustment to suit conditions—saving time and expense in installation. Furnished with indestructible permanent-finish first-surface rhodium G.R.C. metal reflectors; with glass color-roundels in hinged frame. No loose parts. Easily relamped or cleaned. Wired for any number of colors. Made in straight or curved sections, any specified length.



No. 731



OTHER TYPES OF KLIEGL STRIP LIGHTS

Any required form of strip lights—standard or special—for indirect or built-in lighting, can be furnished to meet specifications. Write for price quotations, or copy of our complete CATALOG of Kliegl lighting specialties.

KLIEGL BROS

UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.

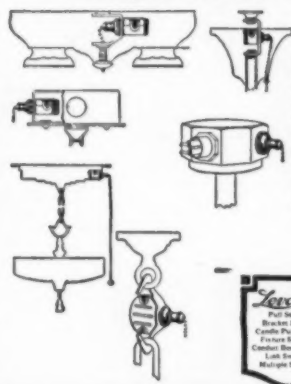
Theatrical · Decorative · Spectacular · Lighting

321 West 50th Street • New York, N.Y.

Levolier

THIN MODEL WINS!

—where Service and
Adaptability Count



The Levolver Thin model Switch No. 41 is an achievement in small switches. The above actual size picture shows it is less than $\frac{3}{8}$ of an inch in thickness. . . In spite of its smallness, it retains all of the practical characteristics of the famous Levolver line. It is the smallest 6 amp. switch made.

At the left are shown six logical uses for this practical Levolver, which may be secured in three different stem lengths.

You'll make no mistake in ordering these Levolver Thin Model Switches



MCGILL

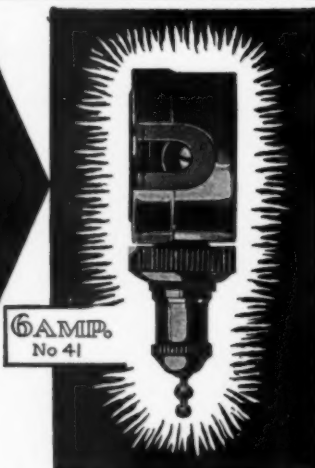
MANUFACTURING CO.

Electrical Specialties of Quality

ESTABLISHED 1904

VALPARAISO - INDIANA

Box No. 470



6 AMP.
No. 41

A ROLL O' TAPE

ELECTRICAL FLASHES
GATHERED AMONG THE
BIG WIRE AND PIPE MEN

BY

ELECTRICAL CONTRACTING'S
FIELD EDITORS

"TEACH them while they are young" is the motto of George Morzfeld, in charge of electrical inspections, fire prevention and safety demonstrations for Kenosha, Wis. Regular programs are conducted in the schools before all classes above the sixth grade.

NIGHT football in Wisconsin pays good dividends on the lighting system investments. According to a recent report a Wausau installation increased receipts from \$100 to \$500 per game, while at Racine receipts jumped from \$600 to \$2500.

TEMPORARY power demands are sometimes important for demonstrating a.c. equipment in d.c. zones. H. F. Trester of Trester Service Electric Co., Milwaukee, Wis., has assembled several small portable motor-generator outfits for such emergencies, and has acquired valuable customers on other work by reason of this special equipment being available on short notice.

IN a full page Better Housing Campaign statement appearing in a recent Kalamazoo, Mich., daily, twenty-one major phases of home modernization are pointed out. The electrical system is listed as one separate item covering seven needed improvements. It is interesting to discover that in the text of the remaining twenty major phases there are nine additional improvements which are purely electrical, or which require the installation of additional wiring.

RADIO interference is kept at a minimum in Grand Rapids, Mich. Two radio interference men attached to the electrical inspection department investigate complaints reported by radio fans. Principal sources of interference are found to be (1) old type single-phase refrigerator motors, (2) primary distri-



F.H.A.

FOR OPPORTUNITY

A.B.C.

FOR STANDARD

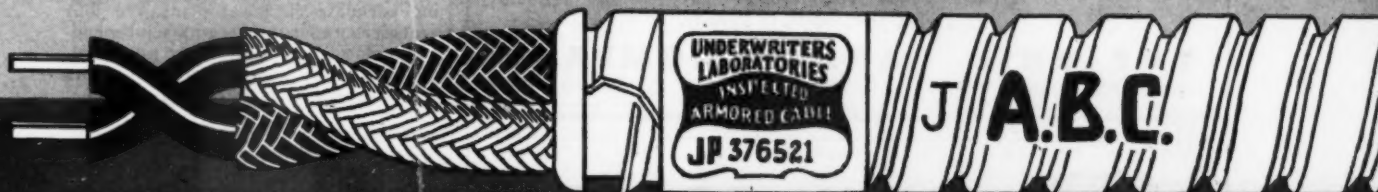
PARANITE

FOR THE BEST ARMORED

CABLE BOTH FOR

MODERNIZATION WORK

AND NEW HOUSE WIRING



PARANITE makes a complete line of rubber-covered wires and cables that are all "more than Code requires." Ask for PARANITE and you get extra quality at no extra cost.

If it's PARANITE it's right

With acceptances from more than 6,000 financial institutions having assets in excess of \$30,000,000,000, the Federal Housing Administration has started its national campaign to promote building remodeling and repairs.

Loans are now being made—contracts are being let—materials are being bought.

F.H.A. is your opportunity to get your business back on a profitable basis—take advantage of it.

A.B.C. is the standard armored cable which you should use on your jobs.

PARANITE A.B.C. is the best armored cable—be sure to furnish it to your customers. Insist upon PARANITE.

PARANITE WIRE & CABLE CORP.

JONESBORO, INDIANA

Division of

ESSEX WIRE CORPORATION, Detroit, Michigan

O H I O

*Solves another Appliance
Brush problem for you!*



Universal Service Kit No. 3

Contains 19 sizes of brushes—five sizes of springs and four sizes of oil wicks which will fit 131 makes of appliances such as vacuum cleaners, washing machines, ironers, pumps, fans, food and drink mixers, office appliances, heat regulators, cash registers, drills, buffers, barber equipment, etc.

NEW! DIFFERENT! UP TO DATE!

This kit is truly universal in its application because of the standardization of brush lengths to one inch. To fit all nationally known equipment, it will be necessary in some cases to shorten a brush slightly but the width and thickness will not have to be changed.

You can readily ascertain by observation which spring or oil wick is to be used as well as figure out further variations of these stock sizes to fit practically any application in the fractional horse power field. If necessary, widths and thicknesses may be altered by judicious use of sandpaper or grinding wheel.

*Order from your jobber or
write direct for complete details.*

THE OHIO CARBON COMPANY

12504 BEREA ROAD

CLEVELAND, OHIO

bution networks, (3) X-ray equipment, (4) sign flashers, (5) defective wiring, and (6) wet, windy weather conditions. The funds for this service are obtained by a \$2.00 tax on each radio receiver sold in Grand Rapids. Two thousand radio receiver permit fees were received in 1933.

WALTER G. KOLB, a Washington, D. C., contractor, writes that he has nine school jobs under way at this time. This is pretty nearly a record, not only for these times, but for good times as well for this one type of building.

THE electric range manufacturers are expecting to sell over two hundred thousand ranges in 1935. If they do it will break the record and provide between 5 and 10 million dollars worth of work for the electrical contractor.

WHEN his rating and inspection bureau employment became curtailed, Ray W. Chanaberry of Louisville, Ky., organized a unique private electrical engineering service in cooperation with the electrical contractors of the Louisville area. In addition to preparing adequate electrical plans, the jobs are given regular inspections independent of local authorities, thus safeguarding the client and quality contractors against chiseling competitors.

THE Detroit (Mich.) contractors have retained their organization facilities, despite a current building volume of only 5 per cent of normal. An office is maintained at a centrally located downtown hotel, adjacent to the offices and board room of the Detroit Electric Club. C. C. Cadwallader, secretary of the Detroit Chapter, N.E.C.A., is kept very busy in this office with matters pertaining to the chapter, and the details of the L.A.C. of the NRA Code.

N. H. A. activities interest P. R. Stenz of the Stenz Electric Co., Milwaukee, Wis., more than just the market for new house wiring. The Stenz Building Co. was formed several years ago for developing a suburban residence addition, which is expected to be built up under a revival of home building.

WORK sharing methods are fairly conducted under the methods employed by George Andrae of the Herman Andrae Electrical Co., Milwaukee, Wis. A "scoreboard" lists all shop and construction employees, whether married, and number of children. Total hours of weekly earnings of each person are posted in the current week's column. Columns are provided for twelve consecutive weeks, thus a quick comparison is available without resorting to the detailed office payroll records.

SIGNS • WINDOW LIGHTS • DEFROSTING • FURNACE CONTROL

NEON • SUBURBAN STATIONS • SIRENS • MANUFACTURING PROCESSES



NEW PRICES

By

**The Pioneers In
Time Switch Popularity**

GENTLEMEN: This is your magazine. We can talk confidentially as it has no consumer circulation. We have just published a new bulletin which shows many substantial price reductions. Here are a few of the popular models—write for complete Bulletin No. 495.

Synchronous Motor Driven or Hand Wound

Cat. No.	Poles	Amps. per Pole	Retail	Your Cost
1315	1	15	\$0.00	\$8.72
131	1	20	\$4.00	\$6.47
122	2	20	\$8.00	\$9.21
121/21	1 & 1	20 2 Cir.	\$2.00	\$1.95

Nearly half a million old style hand wound models need these modern *All Electric* replacements.

515 1 15 16.95 11.64
521 1 20 18.50 12.70
522 2 20 21.75 14.92
These units made to fit in the old case without disturbing connections. Remove key rack—connect wires—you're through.
Return mail quotations on all sorts of special applications or industrial timers.

POSTPAID ANYWHERE IN THE U. S. A.

THE TORK CLOCK COMPANY, Inc.
MOUNT VERNON NEW YORK

"The pioneers in time switch popularity"

LINOTYPE LEAD POTS • POULTRY HOUSES • CHURCH BULLETINS



HALL LIGHTS • AIR CONDITIONING • BURGLAR PROTECTION • COAL STOKERS

*The "SCIENCE OF SEEING" demands
all the LIGHTING EQUIPMENT
can give*

BENJAMIN DOME 100

• COMPLIANCE WITH
REFLECTOR AND LAMP
MANUFACTURERS' STANDARD
SPECIFICATIONS CERTIFIED
ELECTRICAL TESTING
LABORATORIES •

...and the R.L.M. (Reflec-
tor Lamp Manufacturers)
Label is your assurance of
guaranteed performance

The RLM Label—A SYMBOL OF QUALITY—
is found on all Benjamin RLM Dome Reflectors.
This is the reflector which is accepted as
standard for general overhead lighting by the
industrial plants of the country. The RLM label
certifies that the reflector is designed to direct
to the working place a maximum amount of light
with a minimum of glare and contrasting shadows.
Made to the specifications developed by the
lighting experts of the Reflector and Lamp manu-
facturers and certified not to fall below these
standards by the Electrical Testing Laboratories
of New York.

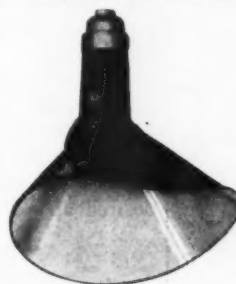
To meet the demands of the new "Science of
Seeing" to get your share of the Better Light-
Better Sight activities that are sweeping the
country—you need these "certified quality"
reflectors. Your customers are being educated
to know and demand everything the lighting
equipment can give. You can satisfy them with
Benjamin lighting equipment.

*Ask your nearest Benjamin distributor for
full information on the Benjamin Better
Light-Better Sight campaign.*



Benjamin "Turnlox" RLM Dome Reflector—

meets the requirements of most industrial plants for good
general overhead lighting. The 17½ degree angle cut-
off below the horizontal assures minimum glare. Porcelain
enamel reflecting surface assures maintained high effi-
ciency. Patented Benjamin Turnlox construction permits
lamp and reflector to come
down as a single unit for
easy cleaning and relamping
on the floor.



Benjamin "Turnlox" Ellip- tical Angle Reflector—

for lighting from the side,
where overhead obstructions,
lighting vertical surfaces,
building up general over-
head illumination makes light-

ing from the side desirable. Lamp and reflector come
down as a single unit.

BENJAMIN ELECTRIC MFG. CO., Des Plaines, Ill. New York, Chicago, San Francisco

BENJAMIN REFLECTORS

FLOODLIGHTS . . . PANELBOARDS . . . FITTINGS . . . SIGNALS

GREENLEE TOOLS

Are Profitable Investments

WHEN you invest in Greenlee Benders and Knockout Tools, you are helping yourself to meet competition and to make a profit on each job. In fact many cases can be cited where these tools have more than paid for themselves on the very first job. And they are liked by the mechanics, too, which is much in their favor.



Hydraulic Conduit Benders

Greenlee Hydraulic Benders are profitable investments, because they bend conduit quicker and easier than by other methods. In addition they make smooth, even bends, eliminating many fittings and making it easy to pull in wire and cable. They are easy to take to the job, too, because they are portable.



Knockout Tools

Greenlee Knockout Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing. And they are easy to operate in close quarters, too.

Other Tools

Hydraulic Pipe Pushers

Joist Borers

Bit Extensions

Electrician Bits

Let Us Send Complete Information

Greenlee
TOOL CO. GREENLEE
ROCKFORD, ILLINOIS, U.S.A.

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

Please send complete information on the following:

- ☐ Conduit Benders
☐ Knockout Tools

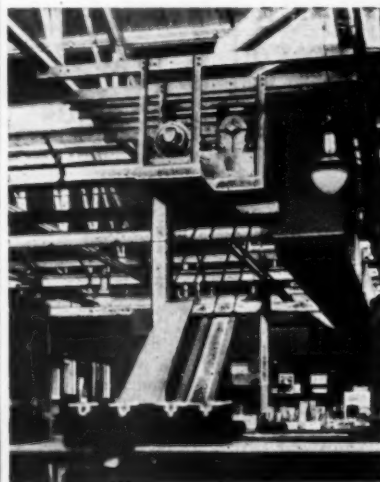
Name
Street
City
State
My Jobber is.....

11-34

PRACTICAL METHODS

OVERHEAD MOTOR FRAME

A space saving method for mounting motors near the ceiling of crowded industrial plants involves the use of steel channel horizontal members secured to roof trusses, with angle iron cradle type suspended platforms. Two or more motors may be bolted to the platform with or without gear reducer



units, after being placed in alignment with driven equipment. This construction is substantial, inexpensive and simple to design. Standard structural shapes are easily secured in desired sizes and lengths, and may be mounted in place at the job. A grease tight sheet metal pan mounted under the platform is also desirable for catching oil drippage from the overhead motors. With this mounting method, the motors are kept up out of the way, are more readily accessible for repairs and replacements than if bolted in an inverted position to trusses, and may be placed wherever desired upon the platform.

JUNCTION BOX FOR ROUND COLUMNS

A junction box designed to fit a round concrete column and also to accommodate the mounting of motor control equipment on its front cover, permitted the use of several concealed conduits which were originally stubbed out of column for an entirely different arrangement of equipment. With this junction box it was possible to



rearrange the conductors emerging from several conduits to the various positions of the control equipment, whereas without using the junction box a complicated arrangement of exposed fittings would have been necessary. This box was made of No. 12 gauge steel, 30 in. wide, 30 in. high and 6 in. minimum depth. The front cover and top and bottom ends were made removable. This method was employed by the Dearborn Electrical Construction Co. of Chicago in a large distillery job.

WORK ORDER FORM

A work order form for the control of extras and changes occurring on jobs has been standardized for use among the members of the Milwaukee Electrical Contractor-Dealers' Association.

City and State		Date
MILWAUKEE ELECTRICAL CONTRACTOR-DEALERS ASSN.		
STANDARD WORK ORDER FORM		
No.	CONTRACTOR	
You are hereby instructed to do the following electrical work in Building		
Located at		
Please returning order page form		
Reference to Customer page form		

Any change or extra which may occur must be authorized by the owner or his representative, regardless of whether or not any extra cost is involved. By obtaining a signed order at the job before making a change, there can be no subsequent misunderstanding since both

Efficient Operation
is not a matter of
Good Luck
with a

SANGAMO

on the job!

Contractors who have used SANGAMO Time-Switches expect continuous, efficient operation.

SANGAMO dependability is not a matter of good luck—real dependable operation is built into SANGAMOS — Over 30 years of experience in the manufacture of precision instruments goes into SANGAMOS, guaranteeing satisfied customers.

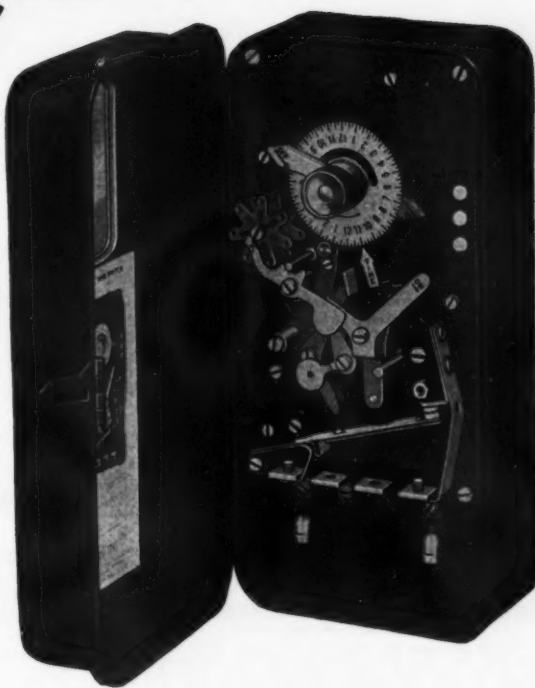
You won't go wrong by buying a SANGAMO Time-Switch for your next and every job.

And, SANGAMOS can be had at reliable wholesalers in every distribution center — Buy SANGAMO Time-Switches.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Manufacturers of

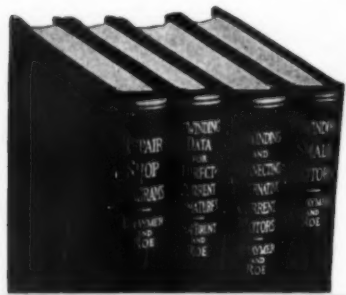
SANGAMO
Precision **TIME - SWITCHES**



Look on the *inside*
of a SANGAMO

Study the compact and sturdy assembly.

Compare the SANGAMO, point for point, with any time-switch — then SANGAMO will be your choice.



NOW—this ELECTRIC MOTOR REPAIR LIBRARY tells how to handle all kinds of profitable repair and re- winding jobs

Do you know how to:

- lay out a wave winding
- test a.c. and d.c. motors to locate grounds, shorts, opens, quickly and positively
- properly record data when stripping armatures so that it will be instantly usable for correct rewinding by yourself or any experienced winder at any time afterward
- determine how many coils can safely be cut out
- lay out single-phase fan motor windings
- change single-phase windings for two- or three-phase operation
- make cross or equalizer connections on lap windings
- lay out frog-leg windings
- handle every step in a rewinding job from the time it comes into the shop until it leaves
- wind stators for turbogenerators
- band high-speed armatures
- rewind motors for voltage, speed, frequency, or cycle changes
- etc., etc., etc.

1,078 pages of practical shop methods and data on jobs like these in this library. A complete, modern key to repair of all motors. Nothing else in it; every page filled with definite, practical facts for the industrial maintenance man and the electric shop worker.

4 volumes, \$10.00, payable in
easy monthly installments

This set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair men, including data difficult to get from any other source.

Low price—easy terms—10 days' examination on approval

Bought separately the books in this Library would cost you \$11. By using this coupon you need pay only \$2.00 in 10 days and \$2.00 monthly until the special price of \$10.00 is paid. In addition, we give you 10 days in which to examine the books. Send no money; simply fill in and mail the coupon now; let us know your answer after you have seen the books.

McGraw-Hill Book Co., Inc.,
350 W. 42nd St., N. Y. C.

Send Electric Motor Repair Library for 10 days' examination on approval. In 10 days I will send \$2.00, plus few cents postage, and \$2.00 monthly for four months, or return books postpaid. (We pay postage on orders accompanied by remittance of first installment.)

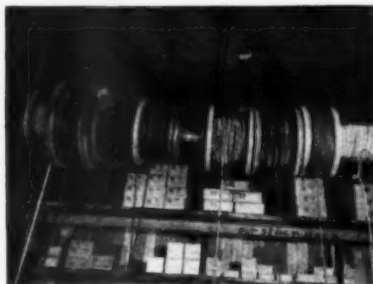
Name.....
Address.....
City and State.....
Position.....
Company.....EC-11-34
(Books sent on approval in U. S. and Canada only.)

the contractor and owner retain a copy of the order for their records. Bound order pads are used which comprise 50 triplicate sets of forms about 3½ in. by 6 in. in size. The original and duplicate copies are perforated for removal while a triplicate tissue copy is retained by the foreman for future reference. Each pad is bound in heavy paper, the inside of the top cover having printed thereon the following instructions:

- 1—To avoid misunderstandings obtain a signed order for all additions and changes from original instructions or contract before such work is started.
- 2—Electricians will be held responsible for any work done without proper authorization.
- 3—Turn in two copies of signed extra order promptly to office and receive a regular work order for same.
- 4—Report accurately and in detail on this work order the material and labor furnished on each item of the extra work.

CORD PAYOUT RACK

Lamp cord stocks may be kept accessible yet up out of the way, and thus save valuable space, by being suspended overhead above a work table. The Enterprise Electric Co., Grand Rapids, Mich., made a cheap yet rugged rack by using a 6 ft.



length of ½ in. conduit for the spool shaft. This assembly is hung from ceiling fan hooks by two chains, each chain having at its bottom end a flat iron rod hanger plate or clevis ¼ in. thick, 3 in. long and 1½ in. wide, which is drilled to slip over the conduit. Standard wall flanges are threaded on the ends of conduit to prevent the chain hangers from coming off. The length of this assembly accommodates an assortment of heater cords, super-service and reinforced cords, and heavy wrapping twine spools. By being located above the stock room work table, which has been marked off for quick measurements, considerable time is saved in cutting the necessary lengths of a desired type of cord.

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For maximum performance in

RUBBER COVERED WIRE

ALWAYS accepted as the highest possible standard for quality—**American Steel & Wire Company Building Wires** now offer the many added advantages of **Safecote** finish. Good news, indeed, because, in addition to superior construction and proved performance of the wire itself—this remarkable finish will not carry or support flame—

pulls more easily—does not soften or crack and is impervious to moisture. Furnished in all standard colors and made in sizes No. 18 AWG to 2,000,000 CM. Send for a sample—put a flame to it—bend it—and you will understand why **Americore—Amparak or Amerite—with Safecote Finish—**will serve you better and more economically.

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1934

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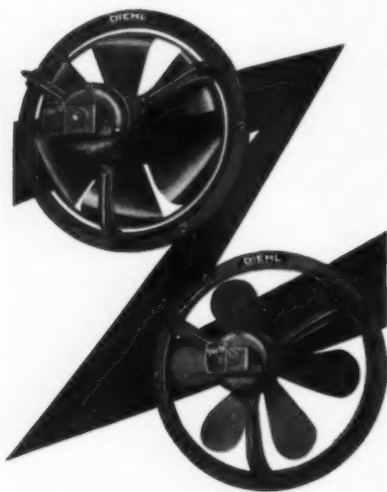
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The demand for fresh, clean air in which to work, play, eat, sleep and live creates a worth-while volume of profitable business for dealers and contractors who handle Diehl Exhaust Fans and Ventilating Equipment.

Diehl offers fans of recognized merit in all standard sizes backed by nearly a half-century-old reputation. Complete warehouse stocks throughout the country insure prompt, efficient service to the trade. Attractive consumer literature and effective dealer helps that stimulate sales are yours for the asking.

Now is the time to push these Diehl products. Write for the two newest bulletins to Diehl Manufacturing Company, Elizabethport, New Jersey. District Offices or Sales Representatives in Atlanta, Boston, Chicago, Cleveland, Dallas, Los Angeles, New York, Philadelphia, San Francisco and St. Louis.



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Electrical Division of
THE SINGER MANUFACTURING COMPANY

904-A

NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

WESTINGHOUSE SUPPLY ANNOUNCES PROMOTIONS

According to a recent announcement by F. A. Merrick, president of the Westinghouse Electric Supply Company, Bonnell W. Clark has been appointed vice-president and general manager of that company and H. N. Gansman and R. J. Holtermann, vice-presidents.

Mr. Clark's headquarters are located at 30 Rockefeller Plaza, New York City, while Mr. Gansman, who became general sales manager in 1931, has his headquarters at 150 Varick St., New York City. Mr. Holtermann is district manager for the firm's entire supply operations west of the Rocky Mountains, with headquarters in its San Francisco offices.

Catalog No. 34 covering Bull Dog controlling and distributing apparatus for electric light and power has just been released by Bull Dog Electric Products Co., Detroit, Mich. The catalog contains information on safety switches, meter service switches, service equipment, fuserenters, Kbl-Duct (for wires and cables), lighting panels and cabinets, Saftofuse distributing panels and cabinets, Nofuse circuit breaker material and electro bus-distribution systems. Specifications and information for ordering are also contained in the catalog, together with list prices and catalog numbers on the different items. The book is illustrated showing the different articles being manufactured by the company.

General Cable Corporation, New York City has just released a 15-page booklet covering Safecote building

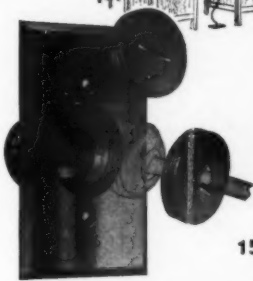
wires and cables. The booklet contains performance specifications, description of the wires and cables, specifications, conduit sizes for wires and cables and calculation of line currents.

Thomas C. Gilpin, who recently resigned as eastern sales manager of Triangle Conduit & Cable Co., Brooklyn, N. Y., has become associated with Walker Brothers, New York City and will serve as assistant vice-president, assuming sales supervisory duties for the company.

U. S. Rubber Products, Inc., New York City, announces the appointments of H. S. McPherson as manager of mechanical sales in the St. Louis district, and W. G. Mueller as manager of mechanical sales in the Boston branch of the company.

Bulletin GEA-1909 describing three types of automatic reclosers for oil-circuit breakers, has just been released by General Electric Co., Schenectady, N. Y. Descriptive matter covers immediate initial reclosure and lockout type; delayed initial reclosure and two subsequent reclosures; immediate or delayed initial reclosure and two subsequent reclosures.

The National Electric Products Corporation, Pittsburgh, Pa., in conjunction with the Better Housing Program, has issued three bulletins explaining and giving sales hints in regard to H.O.L.C. and N.H.A., which they will gladly mail upon request.



**Cat. No. 1532
FLOOR OUTLET**
15 Amp. 125 Volts—10 Amp.
250 Volts

Eliminates the nuisance and danger of running wire leads across the floor. Supplied complete with recessed receptacle, .060 brass plate and two flush screw cover plates.



**Cat. No. 1535
FAN HANGER OUTLET**
15 Amp. 125 Volts—10 Amp.
250 Volts

Clamp type—fits 4" square outlet boxes—fan supporting screw locked in split bushing making a rigid vibrationless assembly. Cat. No. includes .060 brass plate.



**Cat. No. 1533
OUTDOOR
FLUSH RECEPTACLE**
15 Amp. 125 Volts—10 Amp.
250 Volts

Gaskets for both plate and screw cover make it completely weather-proof. .060 brass plate and screw cover cadmium finished to prevent corrosion.



**Cat. No. 1534
CLOCK HANGER OUTLET**
15 Amp. 125 Volts—10 Amp.
250 Volts

Receptacle is recessed for plug cap and cord, allowing clock to hang flush with wall, eliminating the usual unsightly cord connection. Supplied complete with .040 brass plate.

WIRING DEVICES



**Cat. No. 1540
SINGLE FLUSH RECEPTACLE**
15 Amp. 125 Volts—10 Amp. 250 Volts
Brown Bakelite body—easy finding slots.



**Cat. No. 1538
SINGLE RECEPTACLE WITH BOX COVER**
15 Amp. 125 Volts—10 Amp. 250 Volts

Cat. No. 1538,
With 3 1/4" outlet box cover, cadmium finished.
Cat. No. 1539,
With 4" outlet box cover, cadmium finished.

PASS & SEYMOUR, Inc.

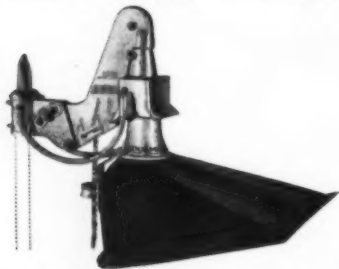
Solvay Station

Syracuse, N. Y.

November New Products

Floodlight Lowering Device

Benjamin Electric Manufacturing Co., Des Plaines, Ill., announces its "Saflox" line of floodlight lowering attachments to permit the safe and easy lowering for cleaning and relamping of its pole-mounted "Duo-Service" or "Play-area"



floodlighting reflectors. Three basic units comprise the device: a sheave housing installed at top of pole, containing terminal blocks, armored wiring connections and lowering chain pulleys; floodlight hood, chain suspension type, with guides for automatic polarized socket alignment, and the chain anchor-lever for attachment to bottom of pole. Manufacturer claims that the design of hood connection prevents light flicker or jarring loose of reflector due to vibration and that raising or lowering of reflector does not affect adjustment for light coverage. All parts not of aluminum castings are heavily cadmium plated. The "Saflox" hood replaces the old mounting heads of the "Duo-Service" or "Play-area" floodlights. Twenty ft. of 1500 lb. test galvanized chain is furnished with each unit.

Laytex Conductor Insulation

A conductor insulation has recently been developed by United States Rubber Products, Inc., New York City, which is claimed to possess properties superior to any present known flexible dielectrics. This product has been named Laytex, since it is derived from latex, the milk of the rubber tree. The manufacturers lay claim to superiority in flexibility, tensile strength, resistance to compression, dielectric strength and insulation resistance. This, in the opinion of the manufacturers, will result in the eventual rewriting of existing Codes and specifications for wire insulation to permit thinner insulation walls, in some cases 50 per cent reduced conductor weights and as much as 25 percent smaller overall diameters, through the application of Laytex insulation. This dielectric is deposited upon the bare conductor while in liquid form by the dip or pass method, which consists of running a conductor through a series of baths of liquid Laytex, each dip resulting in a film of this dielectric being deposited evenly upon the conductor. This film becomes solid almost immediately and before the conductor can come in physical contact or pressure with any mechanical support, thus claiming to produce uniform wall thickness about a perfectly centered conductor. Laytex is claimed to have a tensile strength of 5,000 lbs. per square inch, an elongation

rupturing factor of 750 percent and a set, in a 2-in. gauge length, after a 500 percent stretch, of $\frac{1}{4}$ in. Its electrical characteristics are stated to show an insulation resistance constant more than twice as high as the A.S.T.M. specifications for the best grade of rubber compound, a lower specific inductive capacity than was heretofore known for flexible dielectrics, and a low moisture absorption factor after being soaked in water for 14 days. Tests of this wire insulation have been made in actual use on emergency telephones, underground cables, portable cords, switchboard wire, seismograph wire, vacuum cleaner and radio wires, etc., which, in the opinion of manufacturer, have proven great possibilities for this product.

Hot-Dip Galvanized Conduit

Announcement is made by Enameled Metals Co., Pittsburgh, Pa., manufacturer of the Pittsburgh Standard line of rigid conduit, of the development of a new hot-dip galvanized conduit, for which application has been made for a



patent. The manufacturers state that, so far as they can find, it is the first time on record that the threads have been successfully zinc coated on a hot galvanized rigid conduit. Both the inside and outside of this conduit are hot-dip galvanized, with the threads zinc coated. The interior of the pipe is also given an additional coat over the zinc of a linseed oil base elastic black enamel, which is claimed to make a smooth and non-soluble raceway for wiring. The exterior of the pipe is further coated with a clear acid-proof enamel as added protection.

Super-Power Cleaner-Blower

A portable super-power cleaner or blower for use in the repair or maintenance of motors and other machinery while also suitable for paint or insecticide spraying, is announced by Ideal Commutator Dresser Co., Sycamore, Ill.

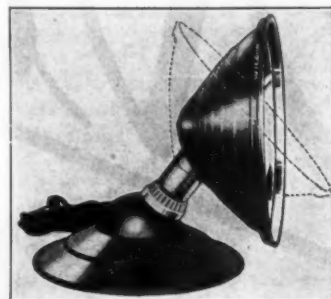


This unit is known as the Jumbo model since it is equipped with a 1 h.p. 11,000 r.p.m. motor. Norma precision ball bearings and a $7\frac{1}{2}$ in. diameter fan are employed. It is rated at 75 cu. ft. p.m. air volume discharge and 24,200 ft. p. m. air velocity discharge in conjunction with a $\frac{3}{4}$ in. diameter nozzle, while a 46.25 in. water lift or static pressure is claimed,

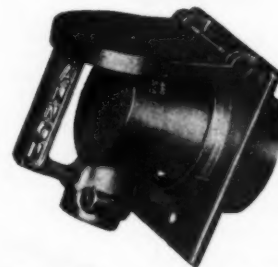
with discharge outlet closed. This portable unit weighs 14 lbs., is equipped with a 20 ft. heavy duty cord and plug and can be supplied for a.c. or d.c., 110 or 220 volts, 25 to 60 cycles. A complete line of special attachments has also been developed for this device.

Portable Reflector-Flood

A portable indoor floodlight designed to take any standard lamp from 60 to 150 watts is announced by Wilson Lighting, Inc., Chicago, Ill. This unit known



as No. C-64 is claimed to be completely adjustable in all directions, and is equipped with a portable base which can be set down or mounted on the wall. A non-breakable reflector of aluminum alloy is provided. A 6 ft. portable cord and plug is furnished wired to unit. Due to the low cost of this unit it is practical for use with photo-flood or photo-flash lamps, and for temporary decorative lighting, where more expensive equipment would not be considered.



Power Plug and Receptacle

A line of 90 deg. handle type plugs and receptacles for power and signal equipment is announced by Cannon Electric Development Co., Los Angeles, Calif. The handle feature is claimed to permit greater ease of plug insertion and withdrawal, while the 90 deg. angle of cord hub leaves the cord in a vertical position free from strain. A positive compression contact feature is claimed to eliminate voltage drop on sound equipment and power applications, and to provide a grip when in contact which makes it unnecessary to provide a locking medium on the cord connectors. The prongs are split at ends so that they collapse under compression while being inserted. This line includes a wide selection of poles in the 30 and 60 amp. size, including 4-pole 440 volt units.

Electrical Contracting, November, 1934

Panther & Dragon Tapes

Backed by Long Experience

PANTHER and Dragon Friction and Rubber Tapes are outstanding among commercial tapes because they are backed by the reputation and experience of the Okonite Company, for over half a century a leader in the insulation field. This background accounts for such features as longer life, greater tensile strength and adhesiveness, freedom from ravelling, and stronger distinctive green cores. It accounts for the up-to-the-minute merchandising value of the striking Modern Packages and displays, and for the protection of the Cellophane wrapping sealed around each roll, a feature originated by Panther and Dragon.

Send for the Panther-Dragon Booklet and ask for further details.

Sold Through Wholesalers Only

- 1 Panther Counter Display. Contains 16 rolls of Panther No. 2.
- 2 Dragon Rubber Tape. Nos. 8, 4. Packed in individual boxes.
- 3 Panther Friction Tape. Nos. 8, 4, 2, and 1 packed in individual boxes.
- 4 Panther Display Back. Contains 10 pounds of Nos. 8, 4, 2 and 1 Panther Tape.
- 5 Handy Package. Contains 10 unboxed rolls of Panther Tape. Nos. 8 or 4.
- 6 Panther Counter Display. Contains 32 rolls of Panther No. 1.

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Division of

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The Best and Safest Method is a properly installed KNOB and TUBE job. Be sure and get the

Bull Dog
REGISTERED

Assembled Knob because it "HAS A GRIP LIKE ITS NAMESAKE."

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS



DO A BETTER JOB
AT LESS COST...with

IDEAL
WIRE CONNECTORS
Solderless — Tapeless



Ideal Wire Connectors make joints of better electrical contact—greater mechanical strength.

A joint in less than a minute—elimination of solder, flux, tape and iron heating—mean drastically reduced costs. Millions of IDEALS are proving their dependability in all types of wiring—roughing-in joints, fixture joints, sign joints, etc. Solderless IDEAL Thread Lugs, too, effect similar savings.

SEND THE COUPON FOR FREE SAMPLES—test them yourself.

Approved by Underwriters' and Factory Mutual Laboratories. Recommended by National Electric Code.

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1041 Park Ave., Sycamore, Ill.
Gentlemen: Send me the samples. I'll test them on my next job.

Name
Address
City State

The Pittsburgh Reflector Company, Pittsburgh, Pa., has just released a 14-page bulletin "Permaflexor Luminaires" pertaining to its line of equipment for indirect illumination. The bulletin features the company's "Lustrolier", an indirect unit with which a selection of soft color lighting effects may be produced. Engineering data for the design of indirect lighting installations are also included, while the bulletin is enclosed in a folder which sizes up the details of ten major lighting sales prospects.

Classified Advertising

Engineer and Estimator Wanted: Established engineering and electrical contracting concern has opening for man with pleasing personality, capable of engineering and estimating all types of electrical wiring installations, for both light and power, and supervising and selling the job. If you are willing to start at reasonable salary with excellent opportunity for advancement, write stating qualifications, salary expected and attach snapshot. Address Box 114, ELECTRICAL CONTRACTING, 520 N. Michigan Ave., Chicago, Ill.

Position Wanted: Experienced young electrician needs work. Can furnish references and am willing to work hard. Address Box 1141, ELECTRICAL CONTRACTING, 520 N. Michigan Ave., Chicago, Ill.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of March 3, 1933
of Electrical Contracting, published monthly at Chicago, Ill., for October 1, 1934.

State of Illinois, County of Cook, ss.
Before me, a notary public, in and for the State and county aforesaid, personally appeared S. B. Williams, who, having been duly sworn according to law, deposes and says that he is the business manager of Electrical Contracting and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, Publisher, managing editor and business manager are: Publisher, Electrical Trade Publishing Co., 520 N. Michigan Ave., Chicago, Ill.; editor, S. B. Williams, 520 N. Michigan Ave., Chicago, Ill.; managing editor, S. B. Williams, 520 N. Michigan Ave., Chicago, Ill.; business manager, S. B. Williams, 520 N. Michigan Ave., Chicago, Ill.

2. That the owner is: (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Electrical Trade Publishing Co., 520 N. Michigan Ave., Chicago, Ill.; Howard Ehrlich, 520 N. Michigan Ave., Chicago, Ill.; Edgar Kobak, Jackson Heights, L. I., New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is (This information is required from daily publications only.)

S. B. WILLIAMS.
Sworn to and subscribed before me this 26th day of September, 1934.
(Seal) Elsie M. Stever.
(My commission expires December 10, 1937.)

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U. S. Pat. No. 1352032



End View

The Sherman brass connector is indeed "The Perfect Solderless Connector." It fits all wires, No. 12 and smaller. Therefore, only one size is needed.

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Made of heavy brass, which cannot rust, thus assuring high conductivity.

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BRYANT SOCKETS



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In Bryant sockets follow-through is exemplified by completeness of line, selling policy, and service.

The few illustrations on this page only indicate typical sockets in the wide range of Bryant designs to fit varying needs.

See the full line in the new Bryant No. 34 Catalog.

FOLLOW-THROUGH
WITH BRYANT SOCKETS
FOR A PERFECT INSTALLATION

BRYANT *Superior Wiring Devices*

Manufactured by THE BRYANT ELECTRIC CO., Bridgeport, Conn.

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MERCURY SWITCHES

Are Conceded to be the Most Desirable Means of Making or Breaking an Electrical Circuit



It is important however to use only the best obtainable.

The name "Mercoïd" on mercury switches insures you the most scientifically constructed switches made. They are known the world over for their unfailing performance.

There are many types available, each having certain patented features adaptable for various requirements.

Mercoïd switches are not affected by dust, dirt or corrosive gases. The contacting surfaces are kept permanently clean and will operate indefinitely under all conditions.

They are the safest and most reliable type of switches.

All Mercoïd Controls are exclusively equipped with mercury switches.

Write for Bulletin No. 500.

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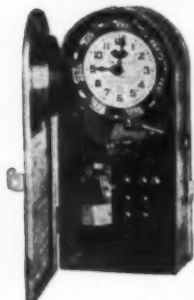
A true transformer-relay in which the transformer also functions as a repulsion-relay.

Entirely different from the clapper type relay. All noises and residual magnetism are eliminated.

For low voltage applications or wherever remote control is required.

Write for Bulletin No. 110.

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Equipped with Waltham movement and self-starting synchronous motor.

Gives accurate electric time as well as dependable switch control.

Various models available for different requirements.

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Sole Manufacturers of The Mercoïd Switch
4223 Belmont Avenue, Chicago, Illinois

Index to Advertisers

A
American Steel & Wire Company.... 47
Arrow-Hart & Hegeman Electric Co.,
The33, 55

B
Benjamin Electric Mfg. Co..... 43
Boston Woven Hose & Rubber Co..34-35
Bryant Electric Co., The..... 53
Burndy Engineering Co., Inc..... 46

C
Chicago Electrode Laboratories.... 54
Chicago Expansion Bolt Co..... 54

D
Dayton Rubber Mfg. Co., The..... 39
Diehl Manufacturing Company..... 48

E
Enameled Metals Company..... 25
Essex Wire Corp. 41

F
Fretz-Moon Tube Co..... 38

G
General Electric Company.....
.....27, 37, Back Cover
Graybar Electric Company..... 4
Greenlee Tool Co..... 44

H
Hazard Insulated Wire Works..... 51
Henderson-Hazel Corporation 56

I
Ideal Commutator Dresser Co..... 52
Illinois Electric Porcelain Co..... 52

J
Jefferson Electric Company..... 31

K
Kliegl Bros. 40

M
McGill Manufacturing Co..... 40
McGraw-Hill Book Co., Inc..... 46
Mercoïd Corporation, The..... 54
Minerallac Electric Company..... 52

N
National Electric Products Corpora-
tionFront Cover

O
Ohio Carbon Company, The..... 42
Okonite Company, The..... 51

P
Paranite Wire & Cable Corp..... 41
Pass & Seymour, Inc..... 49

Q
Quadrangle Manufacturing Co..... 30

R
RCA Victor Company, Inc..... 2

S
S. S. Jobbing House..... 54
Sangamo Electric Company..... 45
Sherman Mfg. Co., H. B..... 52
Square D Company...Inside Back Cover
Standard Transformer Co..... 54
Steel and Tubes, Inc.....28-29

T
Tork Clock Company, Inc., The... 42

U
United States Rubber Company...21-24

W
Wiremold Company, The..... 36

Y
Youngstown Sheet and Tube Com-
pany, The.....Inside Front Cover

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HART & HEGEMAN DIVISION
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MILLIONS FOR**

**BUILDING
AND REPAIR"**



The National Housing Administration is distributing a colossal fortune to build new homes, to repair old ones, to remodel and restore.

Millions will be spent in power and light equipment in new homes. More millions will be spent replacing worn-out, obsolete and inadequate electric service in old homes being remodeled.

Electrical contractors are entitled to a large slice of this huge expenditure. There will be many jobs on which you can use every one of these residential Square D products, each to be

recommended without reserve.

Call on your Square D distributor. See the new Square D residential equipment. Learn all the facts to back up your recommendation of Square D. Be prepared to quote the right prices on the right equipment. Don't let the other fellow get ahead of you.

Have you received the Square D Householder's Booklet—"The Other Entrance to Your Home"?



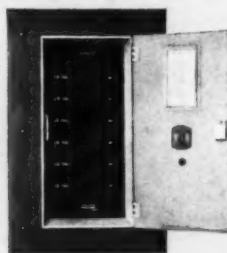
**NOFUSE
LOAD CENTER**

A circuit breaker device with about the same uses as a fuse cabinet.



**ENTRANCE
SWITCH**

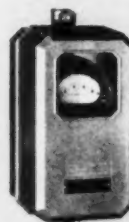
A complete line of orange combinations and service entrance equipment.



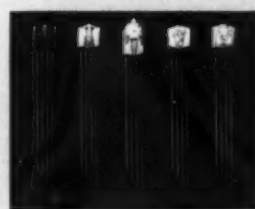
NOFUSE LIGHTING PANEL BOARD—Breaker type lighting panel board, latest pattern. Moulded bakelite interiors and cabinet design and color to harmonize with other furnishings.



A FUSE CABINET—A complete line including all those with 30 ampere circuits, or in combination of 30 and 60 ampere circuits.



OUTDOOR METER BOX—Die cast aluminum outdoor meter box; also available in sheet steel.



ELECTRIC CHIMES

They add a modern touch to every home.



NOFUSE ENTRANCE CABINET—This model is known to the trade as a "NoFuse Service Equipment Breaker."



LIGHTING PANEL—Narrow type fuse lighting panel. Compact and with moulded bakelite unit interior construction.



DISCONNECTING SWITCH—Compact switch for disconnecting water heaters, oil burners, fractional motors and similar equipment.

CALL IN A SQUARE D MAN

SQUARE D COMPANY

DETROIT MICHIGAN U.S.A. MILWAUKEE WISCONSIN

SQUARE D COMPANY, INC., LOS ANGELES, CALIFORNIA
SQUARE D COMPANY CANADA LTD., TORONTO, ONTARIO



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BETTER HOUSING PROGRAM
FEDERAL HOUSING ADMINISTRATION

Building Modernization That Is PROFITABLE FOR YOU & YOUR CUSTOMER

G-E White Explosion-proof Conduit provides old industrial and commercial buildings with modern wiring systems. Use it to modernize wiring systems, to extend direct feeders to new machinery and equipment, to protect wiring systems in hazardous locations. It's easy to install. Guarantees maximum durability, safety, convenience. Increases desirability, life and efficiency of all buildings.

CONDUIT

Modernize obsolete buildings with G-E Fiberduct. Provide factories, office buildings, stores, in fact, all buildings with permanent flexible underfloor wiring systems. Power, signal, telephone outlets can be tapped into wiring system anywhere . . . any time. Install Fiberduct complete or in parts of buildings at any time. Modernization costs quickly paid for by renting of all available space.

FIBERDUCT

The Government, through the Federal Housing Administration, is making money available for modernization of all types of buildings. Contact your prospects. Go with them to FHA Headquarters in your locality immediately for information. For further information on these two G-E Products, and for the new FHA Booklet, see your G-E Merchandise Distributor or write Section CCF-1911, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL  ELECTRIC

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